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DEPARTMENT OF SUSTAINABILITY, ENVIRONMENT, WATER, POPULATION AND COMMUNITIES

WASTE DEFINITIONS AND CLASSIFICATIONS

Report on Issues, Opportunities and Information Gaps

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Report No	AA005528_R01_02
Date	12 February 2012

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GLOSSARY OF TERMS

ABRI	Australian Battery Recycling Initiative
ACOR	Australian Council of Recyclers
AWD	Australian Waste Database
AWT	Alternative Waste Treatment – a resource recovery process combining mechanical and biological treatments to recovery recyclable materials and low grade composted organics
BRWMG	Barwon Regional Waste Management Group
C&D	Construction and Demolition
C&I	Commercial and Industrial
COAG	Council of Australian Governments
СРМ	Carbon Pricing Mechanism
"the department"	Australian Government Department of Sustainability, Environment, Water, Population and Communities
DERM	(former) Queensland Department of Environment and Resource Management (now EHP)
EHP	Queensland Department of Environment and Heritage Protection
EPA	Environment Protection Authority
EPR	Extended Producer Responsibility
ESD	Ecologically Sustainable Development
GRWMG	Gippsland Regional Waste Management Group
LGA	Local Government Areas

MRF	Materials Recovery Facility – a process using combinations of mechanical separation equipment to recover and separate commingled dry recyclables
MSW	Municipal Solid Waste
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NGER	National Greenhouse and Energy Reporting
OECD	Organisation for Economic Co-operation and Development
OEH	NSW Office of Environment and Heritage
PET	Polyethylene terephthalate
PIW	Prescribed industrial waste (Victorian term for hazardous or regulated waste)
REC	Randell Environmental Consulting
SRU	Sustainable Resource Use
ULAB	Used lead acid batteries
VWMA	Victorian Waste Management Association
WCRA	Waste Contractors and Recyclers Association
WEEE	Waste Electrical and Electronic Equipment
WMAA	Waste Management Association of Australia

1 EXECUTIVE SUMMARY

Waste definition and classification systems are used by a range of stakeholders and for a variety of purposes across Australia, including in relation to the management and regulation of different waste materials, and the collection and reporting of information about waste and recycling activities for domestic purposes, and to fulfil Australia's various international reporting obligations.

There is an abundance of definition and classification systems in use across Australia. The Australian Government Department of Sustainability, Environment, Water, Population and Communities (the department) has commissioned Hyder Consulting (Hyder) to undertake this current project in order to explain similarities and differences between the various systems, and to identify specific examples of issues, gaps and opportunities for harmonisation of the definition and classification systems for waste.

Project background, scope and objectives

The National Waste Policy: Less waste, more resources (National Waste Policy) was endorsed by all Australian Governments in 2010. Strategy 4 of the National Waste Policy states:

"The Australian Government, in collaboration with state and territory governments, will introduce a national definition and classification system for wastes (including hazardous and clinical wastes) that aligns with definitions in international conventions, provides for when a product or material ceases to become a waste, and reflects these classifications in relevant policies and instruments".

The Australian Government has commissioned a number of reports to describe the existing waste definition and classification arrangements and contribute to the knowledge base for Strategy 4. Further, in response to various recent consultations, issues in relation to inconsistent waste classification and definition systems have been repeatedly raised by stakeholders ranging from different levels of government to private service providers, industry associations and community groups. However, to date there has been limited evidence provided to help detail those issues.

The scope of the current project includes the consolidation of available information including relevant findings from previous reports; identification of specific issues supported by selected examples developed through targeted stakeholder consultation and a review of existing consultation responses; and a high level discussion of potential opportunities and gaps for decision makers. This report does not attempt to re-state all previous report findings and the user is referred to extracts contained in the appendices of this report or the original reports for more detailed background information.

The main objective of this current project, relative to previous work, is to gather more detailed information related to specific key issues, rather than to provide an exhaustive list of all potential issues. The selected issues explored within this report should therefore be considered as examples. This report is intended to provide an up-to-date evidence base that can assist decision makers in consideration of options for developing a national definition and classification system for wastes.

The current project considers all waste materials, but within the constraints of the limited project timeline, the focus is on identifying specific examples that help to demonstrate the issues with existing approaches to defining and classifying waste in Australia, and most of the examples identified relate to solid waste streams.

Purpose and function of definition and classification systems for waste

At the heart of all waste legislation is the question – *is this a waste and what type of waste is it?* Waste definitions can determine whether a material is a 'waste' or a 'product' or 'resource', and that determination can have significant regulatory, environmental and financial impacts for the whole waste management system, including waste generators, processors, transporters and disposal operators.

The main purpose of definition and classification systems is to assist users to understand the characteristics of waste so that it can be managed and monitored appropriately in a manner that protects human health and the environment.

Historically, the options for managing waste were usually restricted to basic landfill disposal and we had only a limited understanding of the environmental impacts of waste management and disposal practices. Thus, there was little incentive to understand waste characteristics in detail.

As an increasingly detailed understanding of the different degrees of environmental, social and economic risks associated with managing various types of 'waste' has developed, a variety of systems have been established to differentiate between materials. The design of these systems is heavily influenced by its intended purpose and this has led to the establishment of a variety of different systems within and between each Australian jurisdiction.

Many definition and classification systems have been developed to satisfy data and reporting functions, which provide the data on which industry and all levels of government jurisdictions monitor the performance of waste management systems. Other definition and classification systems primarily serve a management function, determining which particular management options are appropriate for a given material or identifying when a particular material should be treated as a useful resource. A number of classification systems have been developed specifically to identify hazardous wastes and determine the appropriate management controls, given their increased potential to cause environmental harm or damage human health.

With so many different definition and classification systems in use, some of which may be open to interpretation, it is foreseeable and understandable that the same material could be defined and classified differently depending on the purpose of the classification, both within a jurisdiction and across jurisdictional borders.

Classifications can also extend beyond the actual substances themselves. Different classifications are often applied throughout the various waste pathways including collection, transport, treatment, recovery and disposal. For example, most jurisdictions have developed classification systems for landfill facilities which dictate the minimum engineering and environmental protection standards that are appropriate to minimise the risks associated with the class of waste being deposited. Definitions may also determine whether a certain action constitutes a waste management activity. For example, the application of recovered material to land may be classed as 'landfilling' or may be considered a legitimate use of materials to restore and rehabilitate that land, depending on definitions and classifications.

An overview of waste definitions and classifications, and discussion of how their design is linked to their function, is provided in this report.

Similarities and differences between existing systems

A myriad of waste-related terms are used and/or defined in policies, strategies and legislation across Australia. The potential issues that arise from this inconsistency have been repeatedly raised by stakeholders across the spectrum of the waste sector and in a variety of public forums. In order to demonstrate examples of similarities and differences, this report considers

the over-arching jurisdictional definitions for a selection of key terms, being 'waste', 'hazardous waste', 'resource' and 'resource recovery'.

Where the terms are defined, each jurisdiction has generally adopted its own unique definition. Even where there are some similarities in the intent of the definitions, different wording has been adopted which results in subtle differences in the application of legislation.

There are different approaches to defining when 'a waste is no longer a waste'. The NSW definition of waste clearly states that a substance is not precluded from being 'waste' merely because it is (or may) be recycled, re-used or recovered. In Queensland, however, the statutory definition states that a material can cease to be waste if it is the subject of a specific resource approval. Such definitions and the associated resource approvals can have a significant impact on markets for waste derived resources and the viability of the recovery activities that produce them.

While the terms 'waste' and 'hazardous waste' have been defined by each jurisdiction, there is a general lack of reference to the terms 'resource' and 'resource recovery' in the over-arching legislation of many jurisdictions. This may reflect different approaches to regulation and control in the jurisdictions or the reality that terminology changes over time. Terms such as 'resource' and 'resource recovery' feature more prominently in the statutory vocabulary of states which have significantly reformed their waste legislation in recent years.

This report finds, as have several other reports before it, that there are indeed a number of inconsistencies in relation to the existing waste definition and classification systems used in Australia. By reviewing former public submissions, and through direct interaction with selected stakeholders for this project, Hyder has identified specific examples of issues.

Local issues

As the community and regulators have demanded higher standards of waste management, the cost and complexity of developing appropriate infrastructure has increased. This often provides an incentive for regional cooperation, where two or more stakeholders (especially councils) seek to work together in order to share costs, and achieve better outcomes than either party can manage on its own.

However, Hyder has identified a number of examples where the use of inconsistent waste classifications has presented a barrier, or at least increased the cost of regional cooperation. With the availability of so many different classification systems, it can be difficult for local governments to determine which system best suits their purpose. A further example demonstrates that, even within an established classification system, different interpretations may skew the outcomes for which the system is intended.

The examples of local issues discussed in this report demonstrate the following key issues with respect to the impact of waste definitions and classifications at a local level:

- Inconsistencies in waste definition and classification systems can act as a barrier to cooperation between councils (or other parties) who may be seeking to jointly develop more efficient systems and infrastructure.
- In particular, the lack of an established national standard for waste audits, which would include a uniform set of waste classifications and definitions, can result in a time and cost impact associated with consolidating, interpreting and comparing waste data.
- Inconsistencies in baseline waste data, arising from the use of different classification systems, can impede (or at least increase the cost of) strategic regional planning of waste infrastructure.

- Within a given system, users may apply inconsistent interpretations, leading to data sets which are difficult to compare and consolidate.
- Attempts to measure the performance of particular approaches or programs using waste data (for example, through benchmarking), may be skewed by inconsistent waste definition and classification systems.

Intra-jurisdictional (internal) issues

Definition and classification systems are critically important to the implementation of jurisdictional waste legislation and regulation. Hyder has discussed at length in this report, the case study of the waste reform experience in Queensland.

The Queensland experience provides an interesting and timely example of challenges that arise when a jurisdiction is forced to develop a bespoke waste classification system to suit its own particular purposes. It also demonstrates that waste classifications can lead to complex issues that can have direct financial impacts on government and industry and may impact on decisions to invest in new resource recovery infrastructure.

Further reforms are now underway in Queensland and a number of lessons that were identified in the original reform process will help shape the new system and may be of relevance in the development of a nationally harmonised system.

Issues can also arise within jurisdictions in defining when a waste material is no longer a waste but a resource or product. This report discusses a recent example where this particular issue had a significant direct impact on existing resource recovery facilities and resulted in the delay or cancellation of at least two major resource recovery projects. Another case highlights how waste definitions can be confused when considering the subject of re-use of waste materials, particularly when materials do not pass through conventional waste management facilities. Even the most comprehensive waste definitions may not necessarily deal with the issue of re-use decisively.

The examples discussed in this report highlight the following key issues with respect to the impact of waste definitions and classifications within a jurisdiction:

- The absence of an established, consistent system of waste definitions and classifications, and the associated data and reporting systems, can be significant barrier to the implementation of waste reforms at a jurisdictional level.
- Waste definitions and classification systems which are developed to serve a specific purpose may have limited relevance or application outside of that function.
- Waste definitions and classifications can have a direct financial impact on governments and industry and may affect decisions to invest in new resource recovery infrastructure.
- Regulators should recognise that it is often frontline workers (for example weighbridge attendants) who actually implement classification systems and make day-to-day decisions on waste classifications. Therefore systems should be simple and user-friendly, compatible with data collection systems (for example weighbridge software) and must be accompanied by appropriate training programs and consistent advice.
- In the absence of adequate guidelines for a waste classification system, users may develop their own interpretations leading to inconsistency in data and significant time and cost impacts when consolidating and assessing the data.
- Waste definitions and associated exemptions which determine that a material is a resource can have a direct impact including financial impacts on existing and future resource recovery infrastructure.

Re-use of materials is one area of particular confusion that is not always clear in jurisdictional waste definitions, as re-use can occur both within and outside conventional waste management systems.

Inter-jurisdictional (between states) issues

Different waste management systems may ably serve the direct requirements of their respective jurisdictions, but this report has identified examples of issues that may arise when waste materials are transported across jurisdictional boundaries, or when stakeholders operate in more than one jurisdiction.

Various stakeholders have indicated that the inconsistency in waste definitions and classifications results in increased costs for administration and compliance for entities that operate across jurisdictional borders. This current report includes reference to a Waste Management Association of Australia (WMAA) feasibility study which found implementation of a single national waste database could potentially provide some councils and waste industry operators cost savings in the vicinity of \$4-5 million compared to business as usual, mainly by reducing the labour-hours spent responding to various reporting requirements.

There is an increasing trend toward the cross-border movement of waste, given the growing differential between waste disposal costs in different jurisdictions, as well as increasingly specialised and sophisticated treatment systems being developed in some locations to manage specific waste types. In the case of hazardous waste, data shows a significant increase in movement across some borders in recent years. As the scale of waste movements increase, so does the scale of the overall impact of regulatory and administrative costs that arise from inconsistent definitions and classification systems.

Different definitions and classifications adopted across jurisdictions are, according to several industry stakeholders consulted in this project, increasing the risk of waste being incorrectly managed and disposed, trucks being turned away from a facility and/or prosecution of operators and transporters under relevant environmental legislation. This issue of confusion is noted in the *National Environment Protection Council Annual Report* (2010–11), which showed 13.6% of all controlled waste movements into Queensland from South Australia during this period had 'non-matching documentation'.

This report also identifies an example where the discrepancy in classifications could lead to a particular type of clinical waste being managed very differently across borders, leading to a potential differential in the level of protection provided for human health and the environment.

Varying waste definitions and classifications between the jurisdictions also complicates the process of comparing waste data across jurisdictions. This report identifies that 'benchmarking' of performance between jurisdictions may be a key tool used by jurisdictions in determining the most effective policy and strategic directions, and identifies examples where this has occurred at the jurisdictional level.

The examples discussed in this report, regarding the impact that waste definitions and classifications can have across jurisdictional borders, highlight the following key issues:

- Inconsistency in waste classifications between jurisdictions may lead to differences in the degree of management and environmental protection applied to particular waste material based on the disposal location.
- Inconsistency in waste definitions and classifications between jurisdictions, coupled with inconsistent hazardous waste coding, can lead to confusion and increased risks in the cross-border transport of hazardous waste, including incorrect disposal or treatment, inaccurate documentation, rejection of materials at the facility gate or regulatory action against those involved.

- The lack of comparable data across jurisdictions can impede waste reform, strategic planning and infrastructure investment decisions at a jurisdictional level.
- Streamlining national waste data, including consistency of definitions and classifications, will result in significant financial savings across governments and industry.

National issues

Waste information used at the national level is generally recorded at the local level and reported through to the Australian Government by the jurisdictional governments. This report discusses how inconsistent waste definitions and classifications can directly contribute to issues of waste data quality at a national level.

The Australian Government has many waste-related reporting obligations, with the *Review of Australia's international waste-related report obligations* (SKM, draft) identifying Australia is signatory to 13 international treaties and conventions that require reporting on waste across a total of more than 20 parameters. Meeting these international reporting obligations requires the provision of data and information collected from a variety of sources, which often use differing definitions, classifications and data collection methods.

The SKM report highlights a number of areas where inconsistent jurisdictional waste definitions and classifications impact on the quality and availability of data required to satisfy Australia's international reporting obligations. The SKM report states:

"Inconsistent waste classifications and terminologies contribute to data gaps and data bias and make it difficult to aggregate and report data. The lack of a common language also decreases the usefulness of shared information and makes it difficult to evaluate outcomes of projects, policies, laws and business transactions. It can also discourage resource recovery."

This report also discusses the impact of inconsistencies between jurisdictional definition and classification systems on the ability to make sound policy and investment decisions at a national level. The *Product Stewardship Act 2011* provides a federal legislative framework to implement national initiatives such as the *National Television and Computer Recycling Scheme*. Such schemes rely on robust national data-sets in order to facilitate good decision-making in relation to target setting and performance monitoring. As discussed many times in this report, inconsistent definitions and classifications affect the quality of baseline data on which such decisions may be made.

This report also considers the impact of inconsistent systems on individual stakeholders working in the waste sector who may work across or move between jurisdictions during their careers. The inconsistency creates an additional training and development burden on staff who need to be familiar with multiple systems and it may lead to confusion, particularly where similar terminology is used to describe different waste or facility types across borders. In general, the increasingly sophisticated nature of the Australian waste industry requires a higher level of training for operators, who are the front line in classifying the waste presented to them, and ensuring it is appropriately managed. But the development of effective training programs for operators is complicated by a lack of harmonisation between existing jurisdictional systems.

This report discusses examples that highlight the following key issues with respect to the impact that waste definition and classifications can have at a national level:

- The aggregation of data that has been provided on the basis of inconsistent definitions, classifications and data collection systems can lead to significant data quality issues and impact on the comparability, completeness and clarity of nationally available data.
- For companies that operate in a number of jurisdictions, the differences in definitions and classifications can increase the cost of compliance with national legislation.

- Jurisdictional differences may add to the confusion and administrative burden associated with the implementation of key national policies.
- Whilst the National Waste Policy does not establish targets, other national programmes do, such as the National Packaging Covenant and initiatives under the Product Stewardship Act. In such cases, the setting of targets and monitoring of progress across jurisdictions should be based on accurate and consistent baseline data, which can be difficult to achieve if the classification systems used for data and reporting in each jurisdiction do not consistently identify waste volumes in appropriate categories.
- The development and implementation of effective training programs for frontline operators undertaking waste classification is complicated by a lack of harmonisation between jurisdictional systems.

Gaps in existing systems

This project has identified a number of gaps in existing waste definitions and classification systems. These include gaps in current waste definitions with respect to re-use of waste materials, particularly outside of conventional waste facilities. This is an area of particular confusion which creates uncertainty and may constrain resource recovery activities.

Another gap identified is with respect to the classification of mixed loads of waste from various sources. In the absence of clear definitions and guidelines, users will develop their own interpretations and classification systems for mixed loads leading to inconsistency. Also, some jurisdictions do not provide consistent and comprehensive guidance for the implementation of classification systems. Experience shows that in the absence of adequate guidance and consistent advice, users will apply their own interpretations when classifying waste.

Finally, existing systems do not cover certain materials very consistently such as disaster waste, waste from primary production (mining, forestry, agriculture, power production), clean fill and dredging spoil.

Opportunities for harmonisation

The issues identified in this report give rise to a number of opportunities to shape any future nationally harmonised system of waste definitions and classifications. These include:

- Consistency in resource exemptions a harmonised system of resource exemptions or approvals should be integral to any new system to define when a waste is no longer a waste. Such mechanisms are critical to markets for recovered resources and the viability of resource recovery activities.
- Guidelines for waste auditing various existing waste auditing guidelines are not currently consistent across jurisdictions and may not be suitable other purposes, such as NGERs reporting. Development of some form of nationally agreed and harmonised best practice waste auditing guidelines may be of significant value in improving the quality and comparability of baseline data collected across Australia.
- Usability of systems given that most waste classification is conducted by frontline operational staff (such as weighbridge operators) classification systems must be easy and intuitive to use.
- Consistent guidance and training following on from the issue above regarding usability of systems, frontline operators must have access to consistent and comprehensive guidance and training to implement the definition and classification systems.

- Alignment of waste and facility classifications classifications for waste materials should, as far as practicable, be aligned to classification systems applied to waste management functions including transport systems, treatment and recovery facilities, and disposal facilities.
- Consistency in scope the scope and coverage of waste definitions should be consistent across jurisdictions. Existing classification approaches vary to materials such as disaster waste, primary production waste (mining, forestry, agriculture and power production), clean fill and dredging spoil.
- Alignment with international reporting any new harmonised definition and classification system should adequately address the data requirements to fulfil Australia's international reporting requirements.

Recommendations

This project has not set out to provide an exhaustive list of all potential issues with existing waste definition and classification systems, nor to design a model for a nationally harmonised system. However, a number of specific issues have been identified and developed through consultation with stakeholders and particular gaps and opportunities have subsequently been identified.

It is recommended that, in implementing Strategy 4 of the *National Waste Policy* and developing a harmonised system of waste definitions and classifications, decision makers consider the issues, gaps and opportunities highlighted in this report.

PROJECT BACKGROUND, SCOPE AND OBJECTIVES

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The National Waste Policy: Less waste, more resources (National Waste Policy), endorsed by the Council of Australian Governments (COAG) in 2010, sets out a direction to 2020, which is focused on producing less waste and managing waste as a resource in order to deliver economic, environmental and social benefits. The Australian Government Department of Sustainability, Environment, Water, Population and Communities (the department) is the lead agency responsible for the implementation of the National Waste Policy.

The *National Waste Policy* contains 16 strategies. Of particular relevance to this current project is Strategy 4, which states that:

"The Australian Government, in collaboration with state and territory governments, will introduce a national definition and classification system for wastes (including hazardous and clinical wastes) that aligns with definitions in international conventions, provides for when a product or material ceases to become a waste, and reflects these classifications in relevant policies and instruments".

Strategy 16 of the National Waste Policy also commits the department to, "Publish a three yearly waste and resource recovery report, underpinned by a system that provides access to integrated national core data on waste and resource recovery". Development of a consistent national definition and classification system for wastes will assist in the delivery of Strategy 16.

The current project is also relevant to the delivery of Strategy 12, which deals with the Australian Government's international obligations with respect to hazardous waste. Two of the particular outcomes expected from Strategy 12 include that "*existing hazardous waste arrangements are mapped to a national classification system for wastes…*" and that "*key government policies and legislation use consistent classifications for hazardous wastes, including clinical wastes…*".

The Australian Government has previously commissioned a number of reports to contribute to the knowledge base for the implementation of Strategy 4, including several which describe existing waste definition and classification arrangements.

Issues in relation to inconsistent waste classification and definition systems have been repeatedly raised by stakeholders, although to date there has been limited evidence provided to help substantiate and detail the issues. The objective of this current project is to gather and collate more detailed information related to specific issues, rather than to provide an exhaustive high-level list of all potential issues. The key identified issues explored within this report should therefore be considered as examples of specific issues, rather than a definitive listing of all current and potential issues.

It has been identified that waste definitions and classifications are used for a number of purposes in Australia, and the same type of material can be classified or defined differently between governments (federal, state and local) or within different systems in a jurisdiction. Of particular concern for the Australian Government is that these differences may pose difficulties with respect to international reporting obligations, and potentially disrupt the efficient operation of markets within Australia.

This current project has been commissioned in order to consolidate key findings from these previous reports, and to identify and explore specific issues with current classification and definition systems. It is intended to assist decision makers in their deliberations about options

for development of a nationally consistent waste classification and definition system, which will be the next step under Strategy 4.

This project considers all waste materials, including solid, liquid and gaseous wastes. However, within the constraints of the limited project timeline, the focus is on identifying specific examples that help to demonstrate the issues with existing approaches to defining and classifying waste in Australia and most of the examples that could be identified relate to solid waste streams.

This project does not seek to develop a national definition and classification system for wastes.

2.1 PROJECT APPROACH

This Chapter describes the approach taken by Hyder in undertaking this project, which was developed in close consultation with the department. It should be noted that Hyder's partner in this project, Randell Environmental Consulting (REC) provided input in the early stages of the project, assisting with development of the project approach and reviewing the interim report.

Step 1 – Review of existing information

Hyder undertook an initial desktop review of existing information, including relevant recent reports produced for the department which detail the existing jurisdictional systems of waste definitions and classifications. The relevant reports commissioned by the department and published on its website¹, include:

- Australian Waste Classifications Roles in decision making (Hyder, 2012)
- Waste Classifications in Australia (Hyder, 2012)
- Liquid Waste Assessment Report (Hyder, 2012)
- Principles of Beneficial Reuse & Resource Recovery (REC, 2012)
- Australian Waste Definitions (SRU, 2012)
- Waste and Recycling in Australia 2011 (Hyder, 2012).

An additional report - *Review of International Reporting Obligations* (SKM, draft), was made available in draft form during compilation of this current study and provides further information on issues of the existing jurisdictional systems with respect to Australia's international waste reporting obligations.

While these reports provide useful detail on existing systems, users should be aware that this is an area of ongoing reform in some jurisdictions and some of the information in these reports may be outdated as legislation and policy changes are implemented. Hyder has updated some of the information from these reports where changes were known to have occurred, but in general Hyder has relied on the information available in the reports.

Hyder also reviewed the public submissions received during key jurisdictional review processes, and during development of the *National Waste Policy*, in order to identify specific issues previously raised by stakeholders from across the waste industry.

Key findings from this desktop review process, including a summary of key similarities and differences between the various definition and classification systems currently in use, are presented in Chapters 4 and 5. References, directing users to additional information on specific interest areas, are integrated throughout this report.

¹ <u>http://www.environment.gov.au/wastepolicy/publications/index.html</u>

Step 2 - Contact with specific stakeholders

A targeted stakeholder consultation process was undertaken, focused on contacting representatives from peak bodies such as the Waste Management Association of Australia (WMAA), the Australian Council of Recycling (ACOR), Waste Contractors and Recyclers Association (WCRA) and members of the National Waste Policy Markets and Standards Working Group, which includes representatives from various jurisdictions and local government. Consultations with industry were limited and generally in relation to specific issues that had been raised in previous consultations.

The purpose of the stakeholder consultation was to identify and develop the examples described in this report and to seek updates on some of the issues raised in previous consultations. Where possible and within the constraints of the project, the case studies and examples detailed in this report have been discussed with the relevant stakeholders.

Appendix A provides a list of key stakeholder organisations directly contacted (via email and/or telephone) in relation to this current project. The level of input to the current project from each organisation varied significantly from confirmation of existing information to provision of detailed, new information on examples of issues.

Step 3 – Exploration of key identified issues

On the basis of the desktop review of existing available information and additional details provided through consultation with stakeholders, a number of specific issues were identified for further investigation. These issues have been grouped as either local, intra-jurisdictional (internal), inter-jurisdictional (between states), or national in scale. This report is not intended to provide an exhaustive list of all potential issues but presents examples which illustrate the key issues and their potential impacts.

Step 4 - Report development and review

An interim version of this report was developed by Hyder, reviewed by REC and provided to the department on 26 November 2012 and made available to the Markets and Standards Working Group, consisting of a number of state and territory representatives, for review. That review gave the Working Group and the department an opportunity to provide input to the project, which has helped to shape this final report.

PURPOSE AND FUNCTION OF DEFINITION AND CLASSIFICATION SYSTEMS

In Australia, the management of waste and environmental protection is primarily the responsibility of the state and territory governments. The Australian Government is responsible for ensuring that Australia's international obligations in relation to waste are met, whether through measures implemented by the Commonwealth or through measures implemented by the jurisdictions.

At the heart of all waste legislation is the question – *is this a waste and what type of waste is it?* Waste definitions can determine whether a material is a 'waste' or a 'product' or 'resource', and that determination can have significant regulatory and financial impacts for waste generators, processors, transporters and disposal operators.

The 'waste' label (or lack of) can have a substantial influence over the opportunities and markets for re-use and reprocessing of materials, with associated environmental and sustainability impacts. Entire waste management and resource recovery industries have developed as a result of government policies and legislative instruments, and the waste definitions on which they are based.

The purpose of definition and classification systems is to assist users to understand the characteristics of waste. This understanding is becoming increasingly important as modern waste management systems become more complex, with services, actions and regulations tailored to differentiate between various types of waste materials.

The broad variety of reasons why an organisation or individual in modern Australian society may wish to understand the characteristics of 'waste' has given rise to a broad range of methods for classifying and describing waste characteristics. In order to understand the evolution of the various systems currently in use, it is useful to consider the general drivers behind the development of waste definition and classification systems.

As noted by Hyder in the *Waste Classifications in Australia* report (published 2012), there is less incentive to differentiate between different types of 'waste' when there is a limited range of options for dealing with that waste. In the relatively recent past, many Australian communities had access to a local 'tip' where any unwanted materials could be dumped at little or no cost. There may have been little understanding of the potential impacts associated with different waste items, and little regulatory oversight of the dumping area.

There is now, however, an increasingly detailed understanding around the different degrees of environmental, social and economic risks associated with managing various types of 'waste'. For example, there is a much higher risk to human health and the natural environment associated with industrial waste from a chemical manufacturing facility than from virgin soil excavated at a green-field construction site. Other materials, such as asbestos, are now recognised as a hazardous waste material, despite being a common household product in the recent past.

Flowing from the greater understanding of potential impacts of different waste materials, stricter controls have been imposed on the management of discarded materials. There are now often price signals in place to reflect the degree of difficulty involved in safely managing different types of waste, and more sophisticated systems and techniques are available for treating waste and/or recovering resources.

Different jurisdictions also adopt different over-arching principles in their approach to setting out waste policy which may be another driver for the waste definitions and classifications that they

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adopt. The department commissioned Randell Environmental Consulting (REC) to develop *Beneficial reuse and resource recovery of waste materials – An inventory on Australian overarching objectives and guiding principles*, which was published in 2012². It maps the overarching objectives and guiding principles of resource recovery in each jurisdiction, and identifies 15 key elements, of which reference to the 'waste hierarchy' is the only element common to all jurisdictions (excluding the Northern Territory). Other elements which were common to the majority of the jurisdictions were Principles of Ecologically Sustainable Development (ESD), Extended Producer Responsibility (EPR), and shared responsibility of waste management.

As waste management systems become more complex, with services, actions and regulations tailored to differentiate between various types of waste materials, there is a greater need to understand the detailed characteristics of waste. This general driver explains why waste definition and classification systems have evolved in Australia, and other developed countries.

Classifications can also extend beyond the actual substances themselves. Different classifications are often applied throughout the various waste pathways including collection, transport, treatment, recovery and disposal. For example, most jurisdictions have developed classification systems for landfill facilities which dictate the minimum engineering and environmental protection standards that are appropriate to minimise the risks associated with the waste being deposited. In some jurisdictions, such as Western Australia, these facility classifications are directly integrated into the waste management classification system.

One of the reasons that different systems have been developed in different areas is that the intended purpose and function of a definition or classification system (how and why the system's developer expects it to be used) can exert a large influence on system design. The way in which stakeholders need to use definition and classification systems is often linked to the strategic direction set by the jurisdictional government and the guiding principles that they have adopted, which can vary considerably between jurisdictions.

With so many different definition and classification systems in use, some of which may be open to interpretation, it is foreseeable and understandable that the same material could be defined and classified differently depending on the purpose of the classification, both within a jurisdiction and across jurisdictional borders.

Many definition and classification systems have been developed to satisfy data and reporting functions. These systems may provide the data on which industry and all levels of government monitor the performance of waste management strategies and initiatives to reduce or recover waste. The data may inform future strategies or the planning of future waste infrastructure, the reform of waste legislation and the establishment of new strategic initiatives including the setting of targets. If they have been developed as part of a system to collect landfill levies, then the policy decisions around such a measure will play a significantly role in shaping the definitions and classifications.

Other definition and classification systems primarily serve a management function. They may determine which particular management options are appropriate for a given material, such as the category of landfill that is suitable for its safe disposal or the degree of treatment required. They can identify when a particular material should be managed as a waste and therefore subject to more rigorous controls and regulation, or treated as a resource to be utilised and marketed in the same way as equivalent virgin-sourced materials.

A number of classification systems have been developed specifically to identify hazardous wastes and determine the appropriate management controls, given their increased potential to

² <u>www.environment.gov.au/wastepolicy/publications/reuse-resource-recovery.html</u>

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cause environmental harm or damage human health. Different jurisdictions have adopted different classification systems for hazardous materials which may include a list of common preclassified materials; a list of activities that produce them and/or criteria based on the chemical and physical properties of the waste such as leachability of contaminants in a landfill environment.

Each individual system can link to one or more functions, and many seem to have been developed (or tailored) specifically to suit that function(s). In some cases, it is not possible to provide a definitive statement as to the specific function of every system.

An overview and comparison of jurisdictional definition and classification systems, and their intended primary functions, is provided in Chapters 4 and 5, respectively.

4 CURRENT DEFINITION SYSTEMS

4.1 OVERVIEW OF DEFINITION SYSTEMS

The legal definitions of waste, as written into various Acts and Regulations, have generally developed organically and independently within each jurisdiction, over a period of many years, in order to enable the various responsible government bodies (such as Environment Protection Agencies) to enforce their Acts. While there are some broad similarities between definitions used in the various jurisdictions, specific wording and practical application is unique to each jurisdiction.

The Australian Waste Classifications - Roles in decision making report, which was produced for the department by Hyder and published in February 2012³, identifies that even where jurisdictions adopt comparable approaches to classifications, different terms may be applied to comparable wastes.

For example, 'hazardous waste' is designated as 'regulated waste' in Queensland, 'listed waste' in South Australia, 'controlled waste' in Tasmania and Western Australia, and as 'prescribed industrial waste' in Victoria. The potential consequence of this and other inconsistencies is confusion for the industry leading to increased regulatory and administrative burdens for entities that operate across jurisdictional borders and anyone who has reason to want to compare waste management practices nationally.

The department commissioned Sustainable Resource Use (SRU) to develop *Australian Waste Definitions – Defining waste related terms by jurisdiction in Australia*, which provides additional detail on key definitions adopted by each jurisdiction. The final report⁴ published in September 2012, includes a summary of the following key definitions (or absent definitions) related to waste and resource recovery, by jurisdiction:

- Waste
- Resource
- Resource recovery
- Hazardous waste.

While the SRU report does not seek to provide a comparison of the definitions across jurisdictions, the collation of these particular key definitions demonstrates the different

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³ <u>www.environment.gov.au/wastepolicy/publications/waste-classifications.html</u>

⁴ www.environment.gov.au/wastepolicy/publications/australian-waste-definitions.html

approaches taken. Where the terms are defined, each jurisdiction has generally adopted its own unique definition. A high-level comparison of these terms is provided in 4.2 below.

It is important to note, that the definitions collated in *Australian Waste Definitions* (SRU, 2012) generally relate to the statutory or formal legal definition of key terms. Terms may also be defined in different ways by jurisdictions at different times. For example, the glossary of the *National Waste Report 2010⁵* includes the following definitions for waste and resource recovery, which do not match statutory definitions:

Waste: any discarded, rejected, unwanted, surplus or abandoned matter; discarded, rejected, unwanted, surplus or abandoned matter intended for recycling, re-processing, recovery, re-use, or purification by a separate operation from that which produced the matter, or for sale, whether of any value or not.

Resource recovery: the process of extracting materials or energy from a waste stream through re-use (using the product for the same or a different purpose without further production), recycling or recovering energy from waste.

The Australian/New Zealand Standard⁶, *AS/NZS 3831:1998 – Waste Management – Glossary of Terms* was published in September 1998. The Joint Technical Committee which prepared the standard included industry members and associations such as the Waste Management Association of Australia, as well as various government bodies.

The foreword to AS/NZS 3831:1998 notes that, "In developing this Standard for Australian and New Zealand purposes, a number of differing definitions were proposed for terms that are legislated in various states or in New Zealand and on occasion differing authorities. The task of the Committee was very difficult given these circumstances".

The foreword goes on to state the hope that, "various states, territories and authorities will adopt the terms and definitions in this Standard for any future purposes which should then assist in achieving the aim of creating consistency across all relevant bodies and authorities. Until this is accomplished, reference should be made to Australian and New Zealand regulations and subordinate legislation as these definitions may take precedence in relation to the interpretation of definitions in this Standard".

There are 86 waste management terms defined in AS/NZS 3831:1998, including:

Waste: Materials and energy which have no further use and are released to the environment as a means of disposal.

Resource recovery: Process that extracts material or energy from the waste stream.

Practical application of waste definitions

One of the most important practical implications of waste definitions is the impact that it can have on management options for a given waste material and on end-use markets for products recovered from waste. For example, whether a waste is defined as hazardous or not, will have a significant impact on the storage, transport, treatment and disposal options available for the material and will likely have significant financial and regulatory implications throughout the management pathway. The ability to re-define products from resource recovery activities as no

⁵ <u>http://www.environment.gov.au/wastepolicy/publications/national-waste-report.html</u>

⁶ http://infostore.saiglobal.com/store2/Details.aspx?ProductID=375132

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longer being waste is critical to developing markets for those products and may ultimately determine the financial viability of such activities.

Despite waste definitions, it is not always a straightforward process to determine whether a material has entered the waste stream or not. One particular area of potential confusion is with respect to the re-use of materials. Re-use generally involves utilising materials in their existing form, often for the same or similar purpose, without any significant processing or modification. Many examples of re-use arise because materials pass directly from the original owner (the generator) to the end-user, bypassing conventional waste management collection and processing pathways.

Quite often in society, items which are surplus or unwanted by one person will be re-used by another, without those items being considered as waste in the statutory sense or being subject to waste regulations. Examples might include the sale of used cars, donation of clothing to a charity shop, disposal of surplus stock through an auction house or the private sale of used items online.

Waste and Recycling in Australia 2011 (Hyder, 2012, p.13) incorporates a revised national method for compiling waste data from the jurisdictions which excludes the re-use of materials from data assessment and reporting. The report notes:

"While a somewhat grey area, re-use is usually seen as evidence that a product has not reached end-of-life, and that it is therefore not a waste. The vast majority of re-use occurs before the material or product enters the waste stream..."

In most cases, re-use can only be practically controlled under waste management frameworks and legislation when it occurs from within the waste stream. 'Tip shops' are now a common component of many local resource recovery centres, where useable items are recovered from the waste stream, repaired and cleaned if necessary and then sold to the public. In many jurisdictions, this particular type of re-use may be considered a form of resource recovery from within the waste system and the items would be defined as waste.

Certain materials would seem to fit the waste definitions in some jurisdictions but are often not considered to be part of the waste stream. In particular, residues from primary production activities are often only considered to have entered the waste stream if they are disposed to an off-site landfill or otherwise collected for off-site reprocessing. Examples include mining and mineral processing waste (e.g. tailings), flyash from power stations, clean fill from site excavations, agricultural waste including crop residues and manure, forestry waste including bark and sawdust, and dredging spoil.

4.2 COMPARISON OF DEFINITIONS

The definitions of waste-related terms adopted by each jurisdiction vary significantly in both their scope and application. The *Australian Waste Definitions* report (SRU, 2012) provides a compilation of definitions from each jurisdiction for particular key terms.

This section presents key information from that report (SRU, 2012) in a manner that allows a high-level cross-jurisdictional comparison of approaches, identifying where there are similarities and differences. The key definitions identified in the report included those for 'waste', 'hazardous waste', 'resource' and 'resource recovery'. These are terms which often play a fundamental role in the way that waste is managed and legislated and this limited comparison serves to demonstrate the different approaches to definitions.

The definitions are compiled from over-arching waste legislation as well as key policy and strategy documents. It is not an exhaustive list or discussion of every waste-related definition.

Nor is it an exhaustive review of every document that includes such definitions. However, it is intended to demonstrate the different approaches to waste definitions and identify some of the practical implications of definitions.

4.2.1 Waste

The defining of a substance as a waste is fundamental to initiating the legislative controls and environmental protection measures that govern waste management practices in each jurisdiction. For many common waste materials, such as mixed household waste, the definition is clear and obvious. For other materials, it may not be so straightforward and in some cases and some jurisdictions, the status of a material can change as a result of processing or other activities.

In most jurisdictions, the scope of the waste definition covers all types of 'matter' and 'substances' including solid, liquid and gaseous wastes. This is consistent with the scope of the *National Waste Policy* which also considers wastes across all three phases. The one exception to this is the Queensland definition which also includes energy and any combination of matter and energy.

Australian Waste Definitions (SRU, 2012) identifies the various definitions for the term 'waste' as adopted by each of the jurisdictions. These are reproduced in Table 4-1.

Although there may be similarities in the intent of the definitions, different wording has been adopted and some definitions are considerably more comprehensive than others. For example, the NSW definition of 'waste' refers to material properties, its potential environmental impact, management and processing activities and its end-use status if recovered as a resource. In contrast, Western Australia's definition is concise but broad in scope, in short, defining waste as "*Matter, whether useful or useless, which is discharged into the environment…*".

The definition adopted by the Australian Government in the *Hazardous Waste Act 1989*, if read in isolation, seems quite narrow. It focuses on 'disposal' of a substance as being the activity that defines a substance as a waste. However, it is important to note that the definition of the term 'disposal' in this case is directly linked to the corresponding definition in the Basel Convention and refers to material entering the waste stream. Disposal in this sense includes conventional disposal activities (such as deposit on land, discharge to the environment, incineration) but also includes "operations which may lead to resource recovery, recycling, reclamation, direct re-use or alternative uses"⁷.

The other major Commonwealth waste legislation, the *Product Stewardship Act 2011*, defines waste very narrowly, as "*waste associated with a product after it is disposed*", reflecting the relatively narrow focus of that legislation. It is noted that no further definition of disposal is provided in the Act.

There are a number of similarities in the definition of waste across most of the jurisdictions. Most jurisdictions define waste materials using various combinations of similar terms such as: discarded, rejected, unwanted, leftover, abandoned and/or surplus.

Western Australia has adopted a slightly different approach, effectively only defining a material as a waste at the point at which it is discharged into the environment, apart from specific wastes prescribed in regulations. As such, materials which may be considered waste by other jurisdictions, but have not yet been discharged to the environment, would not be defined as a waste in Western Australia.

⁷ UNEP, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, Annex IV, p.61.

Most jurisdictions, except Queensland and Tasmania, allow for certain materials to be prescribed as waste in regulations, regardless of whether they fit within the over-arching definition.

NSW, Victoria and the ACT also consider waste to be any emitted material that causes an alteration to the environment. This effectively widens the scope and may include materials that are not deliberately discarded (for example, fugitive releases of product).

In most jurisdictions, the recovery of materials (for example, through re-processing, purification, recycling, reuse) or the sale of a material and the fact that it has value, does not preclude or otherwise affect its classification as a waste. This approach enables the regulator to maintain some level of control over the material within the waste framework, particularly if they have reason to believe that environmental harm may be caused by some use of the recovered materials.

Based on the Queensland definition however, a material can cease to be a waste in the statutory sense if it is the subject of a specific resource approval. However, it should be noted that a resource approval may have certain conditions attached to it and can be cancelled by the regulator if there is a risk of environmental harm, maintaining an element of control.

Other jurisdictions may have systems in place to determine when a substance ceases to be a waste and becomes a product or a resource, which are not directly referenced in the applicable waste definition. Most jurisdictions have approval or exemption systems in place to formally recognise that a waste has become a product, thereby exempting that material from certain regulatory controls that apply to wastes.

NSW legislation specifically states, "A substance is not precluded from being waste for the purposes of this Act merely because it is or may be processed, recycled, re-used or recovered". However, 'resource recovery exemptions' may be granted by the NSW Environment Protection Authority (EPA), which exempt the processor and end-consumer from certain regulatory controls, where the land application or use as a fuel of a waste material is a bona-fide, fit for purpose beneficial reuse opportunity that causes no harm to the environment or human health.

An exemption facilitates the use of these waste materials outside of certain requirements of the waste regulatory framework. For example, in NSW, general exemptions enable composted biosolids or recycled aggregates to be applied to land without that land being a licenced landfill, provided the use is in accordance with the conditions of the general exemption. Such measures have a direct impact on the availability of markets for recovered products and therefore the viability of resource recovery projects and activities.

While the NSW resource recovery exemption process facilitates the beneficial reuse of waste materials, it is important to note the material is still defined as a 'waste' when it is applied to land or used as a fuel. If conditions of the exemption were found to have not been properly followed, or a future pollution incident occurred, the full requirements of the waste regulatory framework could still be applied to the material. However, this "once a waste, always a waste" approach may present an issue for the resource recovery industry as in some markets, the 'waste' label will impact on their ability to market products.

In NSW the most practical mechanism for a material defined as a 'waste' to no longer be defined as a 'waste' is through the reprocessing of the waste materials by recycling into a new product rather than in land application or as a fuel. An example would be the manufacture of a 'Polar Fleece' garment from recycled PET drink bottles (the recycled content within the 'new' product is no longer defined as 'waste').

Table 4-1Definition of 'waste', based on key legislation, regulations and policy or strategy documents in
each jurisdiction - After Australian Waste Definitions – Defining waste related terms by jurisdiction in Australia,
produced for the department by Sustainable Resource Use and published in 2012

Jurisdiction	Waste Definition	Source
Commonwealth	 [1] a substance or objects that: (a) is proposed to be disposed of; or (b) is disposed of; or (c) is required by a law of the Commonwealth, a State or a Territory to be disposed of [2] waste, in relation to a product, means waste associated with the product after it is disposed of 	 [1] Hazardous Waste (Regulation of Exports and Imports) Act 1989 [2] Product Stewardship Act 2011
New South Wales	 [6] (a) any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment, or (b) any discarded, rejected, unwanted, surplus or abandoned substance, or (c) any otherwise discarded, rejected, unwanted, surplus or abandoned substance intended for sale or for recycling, processing, recovery or purification by a separate operation from that which produced the substance, or (d) any processed, recycled, re-used or recovered substance produced wholly or partly from waste that is applied to land, or used as fuel, but only in the circumstances prescribed by the regulations, or (e) any substance is not precluded from being waste for the purposes of this <i>Act</i> merely because it is or may be processed, recycled, re-used or recovered. 	[6] Protection of the Environment Operations Act (POEO Act) 1997, amended 2008
Victoria	 [8] Any matter whether solid, liquid, gaseous or radio-active which is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment; Any discarded, rejected, unwanted, surplus or abandoned matter; Any otherwise discarded, rejected, abandoned, unwanted or surplus matter intended for— Recycling, reprocessing, recovery or purification by a separate operation from that which produced the matter; or Sale; and Any matter prescribed to be waste. 	[8] Environment Protection Act 1970
South Australia	 [12] (a) any discarded, rejected, abandoned, unwanted or surplus matter, whether or not intended for sale or for recycling, reprocessing, recovery or purification by a separate operation from that which produced the matter; or b) anything declared by regulation (after consultation under section 5A) or by an environment protection policy to be waste, whether of value or not. 	[12] Environment Protection Act 1993
Western Australia	[14] Matter, whether useful or useless, which is discharged into the environment, or matter which is prescribed by the regulations to be waste.	[14] Waste Avoidance and Resource Recovery Act 2007

Jurisdiction	Waste Definition	Source
Queensland	 Not defined directly in [10] but the definition in [11] is retained and amended as follows: (1) Waste includes anything, other than a resource approved under the <i>Waste Reduction Act</i>, chapter 8, that is— (a) left over, or an unwanted by-product, from an industrial, commercial, domestic or other activity; or (b) surplus to the industrial, commercial, domestic or other activity generating the waste. (2) Waste can be a gas, liquid, solid or energy, or a combination of any of them. (3) A thing can be waste whether or not it is of value. (4) For subsection (1), if the approval of a resource under the <i>Waste Reduction Act</i>, chapter 8, is a specific approval, the resource stops being waste only in relation to the holder of the approval. (5) Despite subsection (1), a resource approved under the <i>Waste Reduction Act</i>, chapter 8, becomes waste— (a) when it is delivered to a levyable waste disposal site; or (b) if it is deposited at a place in a way that would, apart from its approval under that chapter, constitute a contravention of the general littering provision or the illegal dumping of waste provision under that <i>Act</i>—when the depositing starts. 	 [10] Waste Reduction and Recycling Act 2011 [11] Environmental Protection Act 1994
Tasmania	 [17] (a) discarded, rejected, unwanted, surplus or abandoned matter, whether of any value or not; or (b) discarded, rejected, unwanted, surplus or abandoned matter, whether of any value or not, intended– (i) for recycling, reprocessing, recovery, reuse or purification by a separate operation from that which produced the matter; or (ii) for sale. 	[17] Environmental Management and Pollution Control Act 1994
Australian Capital Territory	 [3] Any solid, liquid or gas, or any combination of them, that is a surplus product or unwanted by-product of any activity, whether the product or by-product has value or not. [4] Includes: (a) any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment in such volume, constituency or manner as to cause an alteration in the environment; (b) any discarded, rejected, unwanted, surplus or abandoned substance, whether or not intended for sale, recycling, reprocessing, recovery or purification by a separate operation from that which produced it; (c) any other substance declared by regulation to be waste. 	 [3] Environment Protection Act 1997 [4] Waste Minimisation Act 2001
Northern Territory	[20] (a) a solid, a liquid or a gas; or	[20] Waste
	(b) a mixture of such substances, that is or are left over, surplus or an unwanted by-product from any activity (whether or not the substance is of value) and includes a prescribed substance or class of substances.	Management and Pollution Control Act 2009

4.2.2 Hazardous Waste

Defining a waste material as 'hazardous' implies that it poses an increased risk to human health and/or the environment, invoking a greater extent of regulation and management procedures. Although hazardous wastes are a relatively small proportion of the overall waste stream, they are often the wastes most frequently transported within and across jurisdictional boundaries given the limited availability of appropriate treatment and disposal facilities.

The Australian Waste Definitions report (SRU, 2012) identifies the various definitions of 'hazardous waste' and other similar terms, as adopted by each of the jurisdictions. These have been reproduced in Table 4-2.

The definition of hazardous waste that has been adopted by the Commonwealth is aligned with the definitions in the Basel Convention, driven by the Commonwealth's obligations to regulate and report on the import and export of hazardous wastes. The Basel Convention, and therefore the Commonwealth definition, also includes waste streams that would not necessarily normally be considered as 'hazardous', namely household waste and incineration residues. These materials are included because their import and export is restricted in the same way that hazardous waste is restricted, and because they may contain some 'hazardous' materials (for example, batteries in the household waste stream). Therefore they are incorporated into a single term that really only has relevance to those particular regulations.

For the Australian States and Territories, the definition of hazardous waste is largely driven by the physical or chemical characteristics of the waste, which may dictate that a higher level of management or disposal is required.

The NSW definition of hazardous waste is quite detailed and specific compared to other jurisdictions. It excludes 'special waste' (clinical waste, asbestos and tyres) or 'liquid waste' as these are defined as separate categories. The NSW definition adopts the categories in the *Australian Dangerous Goods Code*. It also includes a number of specifically identified products as well as referencing the NSW *Waste Classification Guidelines*, by which waste may be classified as hazardous through a process of deduction based on its physical and chemical characteristics.

The ACT definition of hazardous waste also adopts the categories in the national *Dangerous Goods Code*, but then also specifically incorporates pharmaceuticals, poisons, clinical and quarantine waste.

Victoria uses the term 'prescribed industrial waste' (PIW), which is an extension of the definition of industrial waste. Based on an assessment of the chemical composition of the industrial waste, the wastes are classified as either hazarded category A, B, or C PIW. The hazard category determines the management and disposal options of the waste. In addition PIWs may be classified (by EPA Victoria) as appropriate for re-use either directly or after treatment.

Western Australia and Tasmania use the term 'controlled wastes'. In Western Australia, the regulations identify a list of specific substances, rather than defining the term. The list includes a broad range of wastes including liquid waste, asbestos, tyres and clinical waste.

In Tasmania, the definition of controlled waste is aligned with the meaning under the National Environment Protection (Movement of Controlled Wastes Between States and Territories) Measure⁸ (Controlled Waste NEPM), which allows for the tracking of hazardous waste movements across jurisdictional borders, but also allows for regulation to prescribe particular materials as controlled waste.

⁸ <u>http://www.ephc.gov.au/taxonomy/term/46</u>

Queensland uses the term 'regulated waste' which includes various types of waste identified in the regulations. The Queensland definition excludes hazardous waste arising from domestic sources, which is not consistent with definitions in other jurisdictions. The regulations define lower hazard and higher hazard materials. The system allows the hazard rating to be down-graded through treatment and stabilisation processes, thereby encouraging treatment options as a preference to direct landfilling.

South Australia does not define hazardous waste in its *Environmental Protection Act 1993* but it is noted that guidelines published by the EPA align the definition of hazardous waste with the *Controlled Waste NEPM*, as well as a broader definition based on the potential of a waste to cause significant harm to human health or the environment.

The Northern Territory has adopted a very broad definition, based on the presence of substances which pose a threat to living organisms and the environment, including medical and radioactive waste.

Clearly there are significant differences across the jurisdictions in the terminology, scope and application of the definitions for hazardous waste. Some jurisdictions include a wide range of wastes within a single definition, while others such as NSW treat certain materials (for example, liquid waste, tyres and clinical waste) separately.

Some jurisdictions have recognised that there may be benefits and potential efficiencies in aligning their own definitions with those that have been established under existing national systems such as the *Australian Dangerous Goods Code* and the *Controlled Waste NEPM*⁹. It is likely that such an approach can promote a level of streamlining of the management and data collection and reporting systems for the transport, recovery and disposal of hazardous waste across the country and assist those jurisdictions in meeting their own obligations.

⁹ A category-by-category review of jurisdictional classifications associated with implementation of the *Controlled Waste NEPM* is provided as Appendix A of the *Waste Classifications in Australia* report (Hyder, 2012), which is published at www.environment.gov.au/wastepolicy/publications/waste-classifications comparison.html.

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Table 4-2Definition of 'hazardous waste', based on key legislation, regulations and policy or strategy
documents in each jurisdiction - After Australian Waste Definitions – Defining waste related terms by jurisdiction in
Australia, produced for the department by Sustainable Resource Use and published in 2012

Jurisdiction	Hazardous waste definition	Source
Commonwealth	[1] (a) waste prescribed by the regulations, where waste has any of the characteristics mentioned in Annex III of the Basel Convention; or (b) wastes covered by paragraph 1(a) of Article 1 of the Basel Convention; or (c) household waste; or (d) residues arising from the incineration of household waste; but does not include wastes covered by paragraph 4 of Article 1 of the Basel Convention.	[1] Hazardous Waste (Regulation of Exports and Imports) Act 1989
New South Wales	 [6] Hazardous waste means waste (other than special waste or liquid waste) that includes any of the following: (a) anything that is classified as: (i) a substance of Class 1, 2, 5 or 8 within the meaning of the Transport of Dangerous Goods Code, or (ii) a substance to which Division 4.1, 4.2, 4.3 or 6.1 of the Transport of Dangerous Goods Code applies, (b) containers, having previously contained: (i) a substance of Class 1, 3, 4, 5 or 8 within the meaning of the Transport of Dangerous Goods Code, or (ii) a substance of Class 1, 3, 4, 5 or 8 within the meaning of the Transport of Dangerous Goods Code, or (ii) a substance to which Division 6.1 of the Transport of Dangerous Goods Code, or (ii) a substance to which Division 6.1 of the Transport of Dangerous Goods Code applies, from which residues have not been removed by washing or vacuuming, (c) coal tar or coal tar pitch waste (being the tarry residue from the heating, processing or burning of coal or coke) comprising more than 1% (by weight) of coal tar or coal tar pitch waste, (d) lead-acid or nickel-cadmium batteries (being waste generated or separately collected by activities carried out for business, commercial or community services purposes), (e) lead paint waste arising otherwise than from residential premises or educational or child care institutions, (f) anything that is classified as hazardous waste pursuant to an EPA Gazettal notice, (g) anything that is hazardous waste within the meaning of the Waste Classification Guidelines, 	[6] Protection of the Environment Operations Act (POEO Act) 1997, amended 2008
Queensland	 [11] 'Regulated waste' is defined as follows: Waste generated from non-domestic sources that is listed in Schedule 7 of the <i>Environmental Protection Regulation 2008</i>, such as acids, oil, batteries, tyres and clinical waste. Regulated waste may be a solid or liquid. These wastes require a higher level of control and management. Regulated waste classified as lower-hazard for levy collection purposes would include household and business organic wastes Higher-hazard regulated wastes would include asbestos or chemical residues from industrial processes. 	[11] Queensland's Waste Reduction and Recycling Strategy 2010-2020
South Australia	'Hazardous waste' not defined in Acts, but sub-groups under main management classification include 'scheduled waste'.	

Jurisdiction	Hazardous waste definition	Source
Victoria	 Hazardous waste is called 'prescribed industrial waste' in Victoria. The definition of prescribed industrial waste relies on the definition of industrial waste: Industrial waste refers to: a) any waste arising from commercial, industrial or trade activities or from laboratories; or b) any waste containing substances or materials which are potentially harmful to human beings or equipment. Prescribed industrial waste means "any industrial waste or a mixture containing industrial waste that— a) is a Schedule 1 industrial waste; or b) has a direct beneficial reuse and has been consigned for use; or 	[8] Environment Protection Act 1970
	c) is exempt material; ord) is not category A waste, category	
Western Australia	 [15] 'Controlled wastes'. Schedule 1 of the Environmental Protection (Controlled Waste) Regulations 2004 provides a long list of what substances are controlled wastes, but does not define the term. A short definition of controlled waste from the DEC website is: 'Controlled Waste is defined as all liquid waste, and any waste that cannot be disposed as a Class I, II or III landfill site. Controlled Waste also includes asbestos, clinical or related waste, tyres and waste that has been immobilised or encapsulated.' 	[15] EnvironmentalProtection (ControlledWaste) Regulations2004
Tasmania	 [17] 'Controlled waste' is defined in the 1994 Act: controlled waste means – (a) a substance that is controlled waste within the meaning of (i) the National Environment Protection Measure entitled the <i>Movement of Controlled Waste Between States and Territories</i> made by the National Environment Protection Council on 26 June 1998, as amended from time to time; or (ii) any National Environment Protection Measure substituted for the Measure referred to in paragraph (a), as amended from time to time; and (b) a substance that is prescribed by the regulations to be controlled waste; 	[17] Environmental Management and Pollution Control Act 1994
Australian Capital Territory	[5] Any waste that meets the criteria for assessment as dangerous goods under the Australian Code for the Transport of Dangerous Goods by Road and Rail (categorised as one or more of 9 types), Pharmaceuticals and poisons (being waste generated by activities carried out for business, or other commercial purposes and that consists of pharmaceutical or other chemical substances specified in the Poisons List under the <i>Poisons and Therapeutic Goods Act 1966 (NSW)</i>), Clinical waste, Cytotoxic waste, Sharps waste, and Quarantine waste.	[5] ACT Environmental Standards: Assessment and Classification of Liquid & Non-liquid Wastes June 2000.

Jurisdiction	Hazardous waste definition	Source
Northern Territory	[21] 'any waste containing significant quantities of a substance which may present a danger to the life or health of living organisms when released into the environment. These wastes may both include medical and radioactive wastes.'	[21] Guidelines for the Siting, Design and Management of Solid Waste Disposal Sites in the Northern Territory 2003

4.2.3 Resource and Resource Recovery

Just as defining a material as a 'waste' can have a significant impact on its management options, so too can the definition of a given material as a 'resource' (or product) and the activities that constitute 'resource recovery'. Of particular importance for the resource recovery industry is the ability to re-define a material that once was a waste as a resource or product, which can then be utilised and marketed, often as a substitute for virgin-sourced materials.

The ability to call a substance a resource or product, not only reduces some of the compliance burden on reprocessors but may also avoid some of the stigma that can accompany the 'waste' label in the market, particularly when competing against virgin products. For example, the composting industry has expended significant effort to create a more favourable image of compost products derived from garden waste, particularly for the domestic landscaping industry.

As noted in 4.2.1, in the context of statutory definitions, the defining of a material as a resource rather than a waste and the ability to market and utilise products from recycling and reprocessing operations can directly affect the financial viability of those activities and may be a deciding factor in decisions on the development of new resource recovery infrastructure.

Resource is a broad term that encompasses the various materials and energy sources that we utilise and consume in our daily lives. Our consumption of resources has a significant impact on the global environment and the efficient use of resources and reducing the consumption of virgin resources is at the core of sustainability goals. The concept of resource recovery is regularly referred to by all levels of government and the waste management industry as a desirable outcome, driven by the principle that waste materials should be considered resources that have value and should be beneficially utilised where possible. The recovery of resources from waste reduces our reliance on virgin resources, whilst reducing the environmental impact of waste disposal.

Australian Waste Definitions (SRU, 2012) identifies the various definitions for the terms 'resource' and 'resource recovery' that have been adopted by each of the jurisdictions, where they are in use. These have been reproduced in Table 4-3.

The SRU report highlights that these terms are generally not well defined in the over-arching legislation that governs waste management in many jurisdictions, and that a number of jurisdictions refer to the terms without specifically defining them. Victoria, Tasmania, the ACT and the Northern Territory do not define either 'resource' or 'resource recovery' (or similar equivalent terms) within the high-level legislative and strategic documents reviewed by SRU. The documents reviewed by SRU are referenced in the table (note: Hyder has retained SRU's numbering system for references, although these now run out of order given the re-collation of information in the current report).

Queensland, South Australia and Western Australia all define the term 'resource recovery' within their legislation. Together with NSW, these states all make reference to both terms when defining the objectives of their waste legislation. As noted in section 4.2.1, Queensland's

definition of 'waste' specifically excludes resources, where these are defined by a specific approval.

The Commonwealth *Hazardous Waste Act* defines 'resource recovery' by detailing the operations which may be considered to lead to resource recovery. This definition derives from the list in Annex IV of the Basel Convention¹⁰ of "*operations which may lead to resource recovery, recycling reclamation, direct re-use or alternative uses*".

The general lack of reference to these terms in the over-arching legislation of many jurisdictions may reflect the fact that these are terms which have only come into regular use in recent years. As an example, Queensland and Western Australia have both significantly reformed their waste legislation in recent years, so it may be not be surprising that the terms feature more heavily in their legislation, particularly in the objective statements, compared with those jurisdictions where key legislation was developed during an earlier time period.

Table 4-3Definitions of 'resource' and 'resource recovery', based on key legislation, regulations and policy
or strategy documents in each jurisdiction - After Australian Waste Definitions – Defining waste related terms by
jurisdiction in Australia, produced for the department by Sustainable Resource Use and published in 2012

Jurisdictions	Resource Recovery Definitions	Resource Definitions	Source
Commonwealth	 'Resource Recovery' [1] The Hazardous Waste Act 1989 details operations which may lead to resource recovery, recycling, reclamation, direct re- use or alternative use [2] (added by Hyder) Recover in relation to products or waste from products, includes recover resources, material or energy from those products or that waste. 	'Resource' Not defined	 [1] Hazardous Waste (Regulation of Exports and Imports) Act 1989 [2] Product Stewardship Act 2011
New South Wales	'Resource Recovery' [7] Objectives of the <i>WARR Act</i> include 'encourage the most efficient use of resources' and resource recovery in the waste hierarchy.	'Resource' Not defined.	[7] Waste Avoidance and Resource Recovery Act (WARR Act) 2001
Victoria	'Resource Recovery' Not defined in key documents	'Resource' Not defined in key documents.	

¹⁰ <u>http://www.basel.int/Portals/4/Basel%20Convention/docs/text/BaselConventionText-e.pdf</u>

Jurisdictions	Resource Recovery Definitions	Resource Definitions	Source
Queensland	'Resource Recovery' Broadly means the extraction of useful materials or energy from solid waste.	 'Resource' Not directly defined in <i>Act</i>, but addressed in objectives of <i>Waste</i> <i>Reduction and Recycling Act (WARR</i> <i>Act) 2011</i>: (a) to promote waste avoidance and reduction, and resource recovery and efficiency actions; (b) to reduce the consumption of natural resources and minimise the disposal of waste by encouraging waste avoidance and the recovery, re-use and recycling of waste; (c) to minimise the overall impact of waste generation and disposal; (d) to ensure a shared responsibility between government, business and industry and the community in waste management and resource recovery; (e) to support and implement national frameworks, objectives and priorities for waste management and resource recovery. 	 [10] Waste Reduction and Recycling Act (WARR Act) 2011 [11] Queensland's Waste Reduction and Recycling Strategy 2010- 2020
South Australia	'Resource Recovery' [12] (a) reusing the waste; or (b) recycling the waste; or (c) recovering energy or other resources from the waste;	 'Resource' Not defined, but addressed in objectives of legislation [12] as (a) to promote the following principles (principles of ecologically sustainable development): (i) that the use, development and protection of the environment should be managed in a way, and at a rate, that will enable people and communities to provide for their economic, social and physical wellbeing and for their health and safety while sustaining the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations. 	[12] Environment Protection Act 1993
Tasmania	'Resource Recovery' Not defined	'Resource' Not defined.	
Australian Capital Territory	'Resource Recovery' Not defined	'Resource' Not defined. [3] <i>Environment Protection Act 1997</i> does refer to a principle of 'improved valuation and pricing of environmental resources'.	

Jurisdictions	Resource Recovery Definitions	Resource Definitions	Source
Western Australia	'Resource Recovery' [14] Reuse, reprocessing, recycling and energy recovery.	 'Resource' The Waste Avoidance and Resource Recovery Act 2007 states; 1. The primary objects of this Act are to contribute to sustainability, and the protection of human health and the environment, in Western Australia and the move towards a waste free society by (a) promoting the most efficient use of resources, including resource recovery and waste avoidance; and (b) reducing environmental harm, including pollution through waste; and (c) the consideration of resource management options against the following hierarchy: (i) avoidance of unnecessary resource consumption; (ii)resource recovery (including reuse, reprocessing, recycling and energy recovery); (iii) disposal. 	 [14] Waste Avoidance and Resource Recovery Act 2007 [16] Environment Protection Act 1986
Northern Territory	'Resource Recovery' Not defined	'Resource' Not defined.	

5 CURRENT CLASSIFICATION SYSTEMS5.1 OVERVIEW OF CLASSIFICATION SYSTEMS

Once it is determined that a given material is a 'waste' according to the applicable definition, it then needs to be classified in order to assess the most appropriate means of managing the waste and to allow the collection, assessment and reporting of data on the waste. In the case of hazardous wastes, specific classifications have been developed given the particular management requirements and the increased risk that these materials could pose to human health and the environment.

Many classification systems have been developed to satisfy data and reporting functions. These systems have usually been tailored to deliver data in a format that meets the particular reporting function, whether that be monitoring local government waste management and recovery performance, facilitating collection of landfill levies or monitoring trends in disposal and resource recovery practices.

Other classification systems primarily serve a management function. They may determine which particular management options are appropriate for a given material, such as the standard of landfill that is suitable for its safe disposal or the degree of treatment required. They may impact the storage, transport, treatment, recovery and disposal options available for a given material. Classification systems may even play a role in encouraging re-use, source separation or recovery of certain materials as discussed further in 5.2.2.

Systems for classifying hazardous waste are of particular interest and there are a number of reasons why they may be given specific consideration within classification systems. Hazardous waste, by its nature, has an increased potential to cause environmental harm or damage to human health and generally requires a higher degree of control over its transport, treatment and/or disposal. Hazardous waste is also subject to Federal legislation governing international transport and disposal. Given the limited availability of specialised treatment and disposal facilities nationally, hazardous waste is more likely to be transported across jurisdictional boundaries than other categories of waste.

Systems for classifying waste are often directly or closely linked to classification systems for waste management functions such as those for classifying disposal and treatment facilities or collection systems. In Western Australia for example, the waste classification categories are directly coupled with landfill categories, making it clear for the user which standard of landfill is required for a given waste classification.

Waste collection and transport systems, such as kerbside recycling, kerbside residual, bulky waste, self-haul drop-off or C&I collections, can also be classified and can be linked to waste classifications. In some cases, the mode of collection may be integral to the waste definitions and classifications. For example, in some jurisdictions, waste that is self-hauled to a transfer station or landfill may be classified differently to waste that is collected at the kerbside, regardless of its origin and composition. Similar links can be made throughout the waste management pathways from storage and collection systems, to transport, processing and treatment systems, and resource recovery and disposal facilities.

On the basis of the many previous reports prepared on this subject and referenced in this report, it can be concluded that there is a broad range of reasons why an organisation or individual may wish to understand the characteristics of waste. It can also be determined that the extremely broad variety of current methods for classifying and describing waste characteristics in Australia has arisen from the need to develop systems to suit the specific needs of different users.

Each individual classification system may link to one or more functions, and many have been developed (or tailored) specifically to suit that function(s). In some cases, it is not possible to provide a definitive statement as to the specific function of every system.

Most jurisdictions use a number of different classification systems to satisfy these different functions. Previous reports have reviewed the classification systems in use and some of the key information from those reports is presented in 5.2 below. With so many classification systems in use for various purposes, it is foreseeable that a given waste material could be defined and classified differently within and across jurisdictions, depending on the purpose of the classification.

Waste Classifications in Australia (Hyder, 2011) describes the key classification systems being used by jurisdictions to collect, assess and report data at a jurisdictional level. This information has been used below to provide a high-level comparison of classification systems for data and reporting purposes.

Australian Waste Classifications - Roles in decision making (Hyder, 2011) identifies that jurisdictions use multiple classifications for different purposes. It seeks to explain how waste classifications are used to inform decision-making, especially with respect to the management options for waste. Each jurisdiction has a management classification system which determines the requirements for transporting, treating and disposing of wastes. The classification of hazardous waste is typically incorporated within the overall management classification system of each jurisdiction.

5.2 COMPARISON OF CLASSIFICATION SYSTEMS

5.2.1 Data and Reporting Classification Systems

Waste Classifications in Australia (Hyder, 2011) compares existing jurisdictional classification systems with a National Waste Classification System developed in the early 1990s as part of the (now dormant) Australian Waste Database (AWD) project. This database was an early attempt to develop a national classification system and database for waste, and a detailed description of the AWD project is provided within *Waste Classifications in Australia*. During the development of the AWD classification system, it was considered theoretically possible for all jurisdictions to adopt a standard classification system for data and reporting purposes, despite having different statutory systems for designating material as a 'waste'.

There are currently, however, a wide variety of different classification systems in use across Australia. *Waste Classifications in Australia* describes the key classification systems being used by jurisdictions to collect, assess and report data at a jurisdictional level. The report primarily focuses on jurisdictional systems used for data collection and reporting pathways and the classification systems enacted within them although it is noted that some systems may also play a role in determining management pathways. Even with this focus, 23 different jurisdictional classification systems were identified within the existing systems. *Waste Classifications in Australia* also considered classification systems associated with the inter- and intra-state movement of hazardous wastes and implementation of the *Controlled Waste NEPM*. These systems are discussed in Section 5.2.3 on hazardous waste classification systems.

The report also notes a wide variety of additional classification systems are in use across Australia beyond the key systems identified. For example, many private facility operators may use their own classification system for internal record-keeping purposes, while several industry associations also conduct surveys on waste and resource recovery.

At the jurisdictional level, *Waste Classifications in Australia* found that, with the exception of Tasmania and the Northern Territory, each jurisdiction is currently using multiple classification
systems to serve different specific functions. The various systems may have similarities and overlap in their coverage of certain waste streams or materials, but may differ depending on the function for which they have been specifically designed. Generally, jurisdictions have classification systems associated with the monitoring of disposal and recycling activities, and systems for monitoring local government performance in waste management. Some jurisdictions undertake surveys to collect and report data from private industry which also incorporate classification systems.

A summary outline of the 23 jurisdictional classification systems that were identified in *Waste Classifications in Australia* is provided in Table 5-4 and diagrams illustrating each system are reproduced in Appendix F.

Jurisdiction	Description	Link to Function(s)	Primary Focus			Administered by		
			Landfill	Recycling	Hazardous	Other		
NSW	Monthly/Annual Licensed and Non-Licensed Landfill Reporting	Levy administration, landfill monitoring	V				NSW Environment Protection Authority (EPA)	
	Local Government Annual Survey – Landfill & Recycling	Monitoring Local Government waste management performance	√	~				
	Household Chemical Cleanout Reporting	Tracking household hazardous program			~			
Victoria	Quarterly/Annual Landfill Levy Statement	Levy administration	~				Victorian EPA	
	Local Government Annual Survey	Monitoring Local Government waste management performance	~	~			Sustainability Victoria	
	Victorian Recycling Industry Annual Survey	Recycling industry performance		~				
	Victorian Litter Report	Tracking litter management				~		
Queensland	Annual Landfill Reporting – non-levy zone and prior to levy	Landfill disposal monitoring	~				Department of Environment and Heritage	
	Monthly Landfill Reporting – levy zone	Landfill disposal monitoring, Levy administration ¹¹	~				Protection (EHP)	
	Annual Survey of Recyclers	Recycling industry performance		~				
	Annual Local Government Waste Management Survey – Landfill & Recovery	Monitoring Local Government waste management performance	~	~				

Table 5-4 Key waste classification systems used for data and reporting purposes at the jurisdictional level

¹¹ The Queensland levy has been removed and the legislation is currently being amended. However the existing classification systems remained in place at the time of writing.

Jurisdiction	Description	Link to Function(s)	Primary Focus			Administered by		
South Australia	Annual Landfill Reporting	Landfill disposal monitoring, Levy administration	V				South Australian EPA	
	Annual Local Government Survey	Monitoring Local Government waste management performance	√	\checkmark			Office of Local Government	
	Annual Kerbside Performance Reporting	Monitoring kerbside recycling performance		√			Zero Waste SA	
	Annual Recycling Activity Survey	Recycling industry performance		✓				
	Household Hazardous Waste Collection program reporting	Tracking household hazardous program			✓			
Western Australia	Quarterly Metropolitan Landfill Reporting	Landfill disposal monitoring, Levy administration	\checkmark				WA Department of Environment and	
	Local Government Census – Landfill & Recovery	Monitoring Local Government waste management performance	\checkmark	\checkmark			Conservation (DEC)	
	Reprocessing Industry Survey	Recycling industry performance		✓				
Tasmania	Reporting by Regulated Waste Depots	Tracking household hazardous program	~				Tasmania EPA	
ACT	General waste data	Monitoring waste management performance	√	√			Territory and Municipal Services (TAMS)	
	Annual Recycling Industry Statistics Survey	Recycling industry performance		✓				
Northern Territory	Annual Audit and Compliance Report for Licensed Waste Facilities	Landfill disposal monitoring	~				Department of Lands, Planning and Environment	

Waste Classifications in Australia provides a qualitative assessment of the overall alignment of each jurisdiction to the national classification system proposed under the AWD. The report compares existing systems to the AWD classification system merely as a means to assess each system against a common reference point. It does not seek to imply that the National Waste Classification System developed under the AWD is superior to any other classification system or that it should be adopted nationally.

The qualitative assessment was undertaken to assess how well each of the existing jurisdictional data and reporting classification systems compared with four key parameters in the AWD system (excluding transport type):

- 1 Processing / disposal route (recycling, composting, incineration, landfill, on-site)
- 2 Waste stream principal source (municipal waste, commercial & industrial, building and demolition)
- **3** Sub-stream 1 Secondary source (domestic waste, other domestic, other council etc)
- 4 Sub-stream 3 Material composition (mixed, paper / cardboard, glass etc).

Across each of these assessment categories, each jurisdictional classification system was rated according to its alignment with the four key parameters in the AWD using a basic scoring system (1 = not aligned, 2 = partially aligned, 3 = fully aligned). The scores for each parameter were combined and averaged and the overall scores of all of the individual classification systems within a jurisdiction were averaged to give an overall assessment of the alignment for each jurisdiction.

Table 5-5 below (reproduced from the report) summarises the results of the review of classification systems in each jurisdiction, and the overall degree to which they align with the AWD system.

Appendix B contains a summary table reproduced from the *Waste Classifications in Australia* report, showing the various data collection pathways for each Australian jurisdiction that may require the use of classification systems, and the purpose of that data collection.

Table 5-5	Summary of data and reporting classifications reviewed, and their overall alignment
	to the Australian Waste Database
	(From Waste Classifications in Australia (Hyder, 2012), Table 1-1)

Jurisdiction	No. of classification systems identified and reviewed	Overall assessment against the Australian Waste Database
New South Wales	3	Partially aligned
Victoria	4	Not aligned
Queensland	4	Not aligned
South Australia	5	Not aligned
Western Australia	3	Partially aligned
Tasmania	1	Fully aligned
Australian Capital Territory	2	Not aligned
Northern Territory	1	Not aligned
TOTAL	23	N/A

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The AWD comparison above shows that, with the exception of Tasmania which has based its classification system on the AWD, most existing systems are not well aligned or only partially aligned with the AWD. The finding is not intended to be a judgement on any of the existing systems but it serves to demonstrate that there are significant differences between the current systems. It also highlights one of the major challenges associated with developing a nationally harmonised system in response to Strategy 4. Any system which may be developed is unlikely to align closely with most of the existing systems and therefore will require extensive, fundamental changes to the legislative frameworks for most of the jurisdictions.

5.2.2 Management classification systems

Australian Waste Classifications - Roles in decision making (Hyder, 2011) finds most Australian jurisdictions use waste classifications in permitting and licensing, and to determine treatment and disposal methods and standards. Beyond these common uses, however, the primary uses of waste classifications can vary significantly between jurisdictions.

The summary classification diagrams developed for *Australian Waste Classifications - Roles in decision making* (reproduced in Appendix F) help to demonstrate the high-level differences in the approaches adopted by different jurisdictions. For example, in Victoria, waste is initially classified into one of three categories:

- municipal waste
- industrial waste
- prescribed industrial waste.

Across the border in NSW, however, waste is initially classified into one of six categories:

- Special waste (further divided into clinical and related waste, asbestos waste, waste tyres and anything that is classified as special waste pursuant to a NSW EPA Gazettal)
- Liquid waste
- Hazardous waste
- Restricted solid waste
- General solid waste (non-putrescible)
- General solid waste (putrescible).

Most jurisdictions list a number of 'pre-classified' wastes which are usually typical waste materials arising from common activities, often with relatively consistent and well-understood properties. The use of pre-classified materials reduces the burden on waste generators and operators in classifying materials, avoiding the need for specialised sampling and analysis.

The primary management classification systems adopted by each jurisdiction are summarised in *Australian Waste Classifications - Roles in decision making.* These systems are briefly outlined in Table 5-6 and diagrams illustrating each system are reproduced in Appendix F.

Jurisdiction	Summary Outline			
NSW	Risk based approach based on six categories using pre-classified categories for common materials, then assessment based on physical and chemical properties for others: Special, Liquid, Hazardous, Restricted Solid, General Solid Putrescible, General Solid Non-putrescible			
Victoria	Based on source and properties – Municipal, Industrial and Prescribed Industrial Waste (PIW). PIW can be categorised as A, B or C depending on the risk level.			
Queensland	Based on material source (Municipal, C&I, C&D) classified based on lists of source activities. Regulated waste is a subset of the source categories and based on a list of materials. Regulated waste can be high or low hazard.			
South Australia	Based on source (MSW, C&I, C&D) plus hazardous waste and other waste.			
Western Australia	Waste classifications directly aligned with landfill classifications. Waste classification based on pre-classified materials for common sources / activities, otherwise based on chemical and physical properties. Five classes of landfill – Inert, Putrescible (unlined), Putrescible (lined), Secure and Intractable.			
Tasmania	Based on the AWD – uses processing route / source / transport type / composition			
ACT	Risk-based approach based on former NSW system. First step is liquid vs. non- liquid, then inert / solid / industrial / hazardous.			
Northern Territory	Single classification system with 3 high-level categories: putrescible, inert and listed.			

Waste classification systems used for management of waste at the jurisdictional level

While the primary classification system in each jurisdiction is the main tool that determines management requirements, a number of other classification systems may be used to determine treatment, disposal or resource recovery applications. The systems that each jurisdiction has adopted to determine that a material is a resource and not a waste, as discussed in 4.2.1, could themselves be considered classification systems. For example, in NSW, the general resource recovery exemption for biosolids from the treatment of sewage, relies on various quality standards and parameters as defined in the *Environmental Guidelines – Use and Disposal of Biosolids Products* (NSW EPA, 2000). Based on the pathogen and contaminant levels, biosolids are classified through a risk-management approach which determines the applications for which they can be used including unrestricted domestic use, public places, urban landscaping, agriculture and land rehabilitation.

5.2.3 Hazardous waste classification systems

As discussed above, most jurisdictions have a primary management classification system which usually incorporates one or more hazardous categories. This may be based on a list of common waste types and/or activities that generate the waste, a risk-based approach based on chemical and physical properties or a combination of approaches.

Table 5-6

Australian Waste Classifications - Roles of decision making (Hyder, 2011, p.1) noted that:

Victoria's approach focuses primarily on Prescribed Industrial Waste (known elsewhere as 'hazardous waste' or other terms) while Queensland's classifications serve primarily to drive wastes toward specific treatment paths. New South Wales' classifications primarily affect disposal options for specific wastes and incorporate a risk-based approach. In Western Australia and South Australia, waste classifications are used primarily to direct wastes to specific disposal facilities best suited for those classes of waste. Western Australia has also taken more of a management-based approach than the risk-based approach common in other jurisdictions. These approaches to classification may vary from the classifications used for reporting requirements.

Hazardous waste may be further classified according to the hazard level and in some jurisdictions (e.g. Victoria and Queensland), it may be possible to reduce the hazard classification of a waste by applying a treatment or stabilisation process, thereby allowing a lower standard of transport and disposal. This measure can be seen to encourage treatment and recovery options over direct landfilling.

Most waste classification systems encourage the source separation of waste in that a mixture of materials will usually be classified according to the highest-risk component. Therefore a load that is predominantly non-hazardous but contains a small amount of hazardous waste would be classified as hazardous. This source separation further encourages and enables opportunities for minimisation, recycling and re-use.

Hazardous waste classifications are often closely linked to classifications for landfill sites. Waste and landfill types are directly linked in Western Australia's classification guidelines¹². In Victoria, category A prescribed industrial waste cannot be landfilled and must be treated to reduce its hazard rating to B or C before it can be landfilled.

Waste Classifications in Australia (Hyder, 2011) provides a high-level review of classification systems for hazardous waste across the jurisdictions comparing jurisdictional systems to the *Controlled Waste NEPM*. It notes that all Australian jurisdictions have incorporated provisions of the *Controlled Waste NEPM* into relevant jurisdictional legislation in order to monitor the production, movement and treatment or disposal of controlled wastes across borders.

Waste Classifications in Australia also notes that, in some instances, the classification system used in relation to the movement of controlled waste *within* a jurisdiction may differ from the classification system used for the movement of controlled waste across jurisdictional borders, placing controls on additional materials, which are not included in the *Controlled Waste NEPM*.

Therefore, despite the national approach to developing the *Controlled Waste NEPM* there are still inconsistencies and these are highlighted in Appendix C, which presents a summary table comparing hazardous waste tracking systems in each jurisdiction against the categories in the *Controlled Waste NEPM* (reproduced from the *Liquid Waste Assessment Report* (Hyder, 2012)). As detailed in section 6.4, feedback from one national hazardous waste operator indicates that this inconsistency across jurisdictions can lead to genuine financial and regulatory impacts.

¹²http://portal.environment.wa.gov.au/pls/portal/docs/PAGE/DOE_ADMIN/GUIDELINE_REPOSITORY/LANDFILL_WAST <u>E_CLASSIFICN_V3_2004.PDF</u>

6 IDENTIFICATION OF KEY ISSUES

The application of waste policy, legislation and regulation requires (to varying degrees) the use of definition and classification systems to identify and describe different materials. Accordingly, issues related to waste definition and classification have been raised and considered during development of the *National Waste Policy*, and during most of the major jurisdictional waste reviews undertaken in Australia in recent years.

Hyder has reviewed public submissions made to a number of the more significant review processes undertaken since 2009, in order to identify the key waste definition and classification issues raised by stakeholders. A summary of relevant outcomes from each review is provided in Section 6.1.

A number of recurring themes were detected in the various submissions, commonly expressed in terms of general statements highlighting potential issues and expressing support for greater harmonisation between different systems. Generally, there appears to be a gap in terms of detailed information about specific examples of issues with waste definitions or classifications that have caused real-life problems for stakeholders.

Sections 6.2 - 6.5 describe examples of some specific issues that Hyder has identified through the literature review process, the review of public submissions, and subsequent direct discussions with targeted stakeholders contacted during this project. This is not intended as an exhaustive list of all possible issues, but rather provides illustrative evidence of the types of issues that exist including the potential impacts on government and industry. The examples also serve to demonstrate the types of issues, gaps and opportunities for harmonisation that exist. The examples of issues are grouped according to the following characteristics:

- Local issues
- Intra-jurisdictional (internal) issues
- Inter-jurisdictional (between states) issues
- National issues.

6.1 REVIEW OF EXISTING CONSULTATIONS

The following sections provide an overview of how waste definition and classification issues have featured in, and been addressed during, a selection of recent key consultation processes.

6.1.1 National Waste Policy

As part of the consultative process associated with the formulation of the *National Waste Policy*, public submissions were invited in April 2009 to a consultation paper entitled *A National Waste Policy: Managing Waste to 2020* (the "consultation paper"). Another round of public submissions was invited in July 2009 following the release of a discussion paper entitled *Draft National Waste Policy Framework – less waste more resources* (the "discussion paper").

The "consultation paper" formed the basis of the initial consultative process that led to development of the *National Waste Policy*, with a series of public consultation sessions held and 143 written public submissions received. The consultation paper invited discussion on a set of 18 questions, designed to address the current state of waste management in Australia, and future directions. Of specific relevance to this current report were the following questions:

1 Are there opportunities to further coordinate, harmonise or streamline approaches to waste management across jurisdictions?

- 2 Are the categorisations, definitions and standards used to manage waste between and within the different levels of government effective and appropriate?
- 3 Do the current waste management frameworks across jurisdictions:
 - deliver an effective regulatory framework?
 - provide an appropriate suite of approaches to address waste and resource recovery issues?
 - work effectively in conjunction with planning and other environmental legislation?
 - provide the right incentives to manage materials, products and waste sustainably and holistically?
 - need improving, and if so, how could this be done?
- **5** What waste issues would most benefit from a national approach? What strategies could be considered and how could the need for local solutions be integrated with a national approach?
- **9** Are there any aspects of waste management that could be improved or streamlined through adopting national standards?
- **10** What fundamental data sets does Australia need to collect to better inform waste management policies, practices, investment, business operations and to assess and manage risk?

The feedback received on the consultation paper contributed to the formulation of a draft *National Waste Policy Framework*, from which the "discussion paper" was released for further public consultation. The discussion paper outlined the draft *National Waste Policy Framework*, and invited feedback on strategies and actions that could improve the framework. Over 60 written public submissions were received.

A large proportion of the submissions received for both the consultation paper and the discussion paper are published on the department's website¹³.

As part of this current project, Hyder reviewed these submissions and found approximately half of the total 165 submissions made comment on the need for national harmonisation of waste classification and definition systems. Only two submitters expressed a view that current systems and arrangements were sufficient.

Comments ranged from general support for a national waste definition and classification system, to urgent calls from industry for a national system to improve market conditions and reduce cross-jurisdictional administration costs.

Several recurring themes emerged within the submissions, such as the need for clarification around hazardous waste classifications and definitions, labelling for waste-derived products, and issues arising from NGERS reporting.

¹³ <u>http://www.environment.gov.au/wastepolicy/consultation/index.html</u>

6.1.2 Victoria Waste Policy Review

The Victorian Government began a review of its waste policy in 2012, conducting a series of public workshops and inviting written submissions to a *Waste Policy Review Discussion paper* to inform the *Draft Victorian Waste and Resource Recovery Policy*, ¹⁴ published in October 2012.

Over 60 written submissions were received and are published on the website of the Victorian Department of Sustainability and Environment¹⁵. While no questions in the discussion paper specifically concerned waste definitions and classifications, approximately one quarter of submissions mentioned the need for national harmonisation of waste definitions and classifications.

Two recurring themes in these submissions were the need to set standards and specifications for products made from recycled materials, and the need for standardised definitions and classifications to assist in planning and investment decisions.

This feedback resulted in the following relevant provision in the *Draft Victorian Waste and Resource Recovery Policy* (p.18):

"Where new product standards or specifications are needed, such as for the application of treated organic wastes to land, work with industry, the manufacturers of recycled products and potential users to develop standards or specifications, in cooperation with other governments. Where there are existing standards, work in co-operation with other Australian governments, to improve their consistency and recognition nationally."

6.1.3 NSW Waste Policy and Strategy Review

The Waste Avoidance and Resource Recovery Act 2001 (NSW) required a strategy to be developed to implement the objectives of the Act. The first Waste Avoidance and Resource Recovery Strategy was developed in 2003, and later updated in 2007. The 2007 Waste Avoidance and Resource Recovery Strategy then underwent a review in 2010 entitled Review of Waste Strategy and Policy in New South Wales¹⁶ (the Richmond Review).

While full public consultation was not undertaken for the 2010 Richmond Review, a number of targeted stakeholders were contacted for comment, including government agencies and stakeholders from the C&I sector and the municipal sector.

In relation to the need for a national system of definitions and classifications, the following enhancement to the existing waste strategy was proposed (p.50):

"Enhancement 23 – National waste agenda – NSW should continue to support the delivery of the National Waste Policy and its Implementation Plan. It should drive the national waste agenda by taking a leadership role in issues requiring national coordination, particularly the acceleration of EPR schemes, agreement on a system for comparing waste data, and improving markets for recovered materials. In addition, NSW should promote the need

¹⁴ <u>http://www.dse.vic.gov.au/___data/assets/pdf_file/0009/147384/7123-DSE-Draft-Resource-recovery-policy-WEB-v4.pdf</u>

¹⁵ <u>http://www.dse.vic.gov.au/conservation-and-environment/sustainability/waste-management-and-resource-efficiency/waste-policy-review-public-submissions</u>

¹⁶ http://www.environment.nsw.gov.au/resources/warr/101034RevWasteStrat.pdf

for Australian Government funding and grants for major waste infrastructure."

The Review also stated (p.52):

"NSW is a strong proponent of a practical and appropriate national data system that will deliver data that is cost effective and fit for purpose. DECCW has extensive experience in data collection and a strong interest in improving the comparability of jurisdictional data. NSW also has a strong interest in ensuring this work does not end up failing as similar initiatives have done in the past."

6.1.4 WA Waste Policy

Consultation for *Western Australia's Waste Strategy*,¹⁷ which was published in 2012, was undertaken through a series of public workshops and an invitation to contribute written submissions. Public comments were summarised in a document published on the WA Waste Authority's website¹⁸ and included discussion around the need to align the strategy's definitions and indices with national documents, such as the *National Waste Policy* and the National Litter Index.

The final Waste Strategy contained the following sub-strategy in relation to harmonising waste definitions and classifications:

2 c. Develop product specifications to better define recycled products made from wastes to support their application in relevant circumstances.

¹⁷ <u>http://www.zerowaste.wa.gov.au/media/files/documents/WA_Waste_Strategy.pdf</u>

¹⁸ <u>http://www.zerowaste.wa.gov.au/media/files/documents/draft_waste_strategy_workshop_submission_analysis.pdf</u>

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6.2 LOCAL ISSUES

Information on the types and quantities of waste material being generated and directed toward different management pathways (treatment, recovery or disposal) forms an integral part of the 'baseline data' that is usually considered to be critically important for making informed decisions in relation to waste and recycling strategies. Compiling this 'baseline data' usually requires the application of waste definition and classification systems.

An individual user (such as a specific council) may adopt certain definitions and classifications that suit its particular need. However, barriers to cooperation may arise when one user seeks to cooperate with another user that has adopted different definition and classification systems. These barriers to cooperation may stymie opportunities to develop more efficient systems and infrastructure, and may increase the costs of managing waste.

One example of this issue, which was discussed with stakeholders within the Western Australian Government during the compilation of this current report, relates to infrastructure planning in the Pilbara region. The region covers an area of approximately 500 000km² and the current population is around 60 000 (ABS, 2011)¹⁹. Planning WA projects the regional population will more than double to 140 000 by 2035.

The WA Government is seeking to identify long-term waste management infrastructure needs in the Pilbara, in order to assist in the planning and delivery of an efficient network of infrastructure that can adequately meet the waste management needs of the community, as well as contributing to the strategic goals of the state government. In order to conduct this long-term planning, it is necessary to project future demand in terms of quantities and types of waste materials that will require management.

Relevant baseline data is currently gathered by a variety of stakeholders, including different councils, private landfill operators, and industrial waste generators. However, the state government has identified there is little consistency in the way the various pieces of information are gathered and collated, due to different stakeholders using different classification systems.

At the time of writing, the Western Australia Government was seeking to commission a consultancy to collate and harmonise the various data sources, so that they can be used to inform long-term modelling to support the regional infrastructure planning. The cost of this exercise is expected to be around \$100 000. It is likely this cost could have been avoided if each of the relevant stakeholders was already collecting and collating baseline data in a consistent fashion. This example demonstrates how inconsistent classification systems can impede or at least increase the cost of, strategic regional planning of waste infrastructure.

A similar example of this issue was discussed with stakeholders representing the Barwon Regional Waste Management Group (BRWMG) and the Gippsland Regional Waste Management Group (GRWMG) in Victoria. BRWMG covers four local government areas (LGAs) in south eastern Victoria, and includes the larger regional centres of Geelong and Warrnambool as well as coastal and inland towns and rural communities. GRWMG encompasses six municipalities with a population of almost 250 000 people, making it the largest regional waste management group (by area) in the state.

Both groups are seeking to improve their access to reliable and consistent baseline data, which will assist in planning long-term infrastructure as well as informing other policy and management decisions. A major focus for the group is to align the data collection and reporting systems used

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¹⁹ <u>http://www.censusdata.abs.gov.au/census_services/getproduct/census/2011/quickstat/50806</u>

by each member council, which involves ensuring all councils use the same definition and classification systems.

The issue faced by the groups is the selection of which classification system to adopt and consistently apply across each member council. During discussions with council stakeholders as part of the current project, it became apparent that at least three potential classification systems were being considered, and despite broad similarities each is slightly different. One was developed specifically for GRWMG (by Hyder) in 2008, based on Victorian guidelines at the time; one was more recently developed for Sustainability Victoria (REC, currently in draft); and one was developed for use in *Waste and Recycling in Australia 2011* (Hyder, 2012).

A further example of inconsistent waste classification systems presenting a barrier to regional cooperation can be drawn from Hyder's direct experience working with regional groupings of councils. In a recent example, Hyder was commissioned by two neighbouring NSW councils to develop a Regional Waste Strategy.

Despite these neighbouring councils having waste audits undertaken in the same time period by the same service provider, different classification systems were used to assess and report data. The net result was that, in order to meet the objectives of the project Hyder was commissioned to undertake, it was necessary to spend approximately 10 hours working to consolidate the two information sources into a single format. The theoretical additional cost to the councils of having used different classification systems for their waste audits could be estimated at around \$1500 for the particular project in this example.

Another issue Hyder has directly experienced when working with different groupings of regional councils relates to the definition of 'resource recovery'. Specifically, when councils record and report the quantity of waste recovered through kerbside recycling services, some will take account of the small proportion of residual material that is rejected at the recycling facility and disposed to landfill and report the 'net' recovery as the volume excluding residuals disposed to landfill. Other councils will record the total quantity of material that is collected and sent to a recycling facility as being recovered, ignoring the impact of residuals. This seems to occur particularly when the recycling facility is not under the control of the council and the responsibility for disposing of residuals rests with the processor. In some cases, it may not be realistic to expect that the council will have access to recovery rate data for a facility outside of their control.

Given the benchmark residual waste (contamination) rate at domestic materials recycling facilities (MRFs) is typically about 10% of incoming feedstock, the decision by a council to account for the residuals or not can have a significant impact on their reported recycling rate.

In order to illustrate the above example, consider a theoretical council generating 100 000 tonnes of municipal waste, of which 50 000 tonnes is disposed to landfill while 50 000 tonnes is delivered to a MRF. The MRF achieves a 90% recovery efficiency (therefore, 10% of incoming feedstock is disposed as residual waste from the MRF). The council's net (real) resource recovery rate would be calculated as 45%, but if they ignore the MRF residuals or do not have access to that data (as observed by Hyder) the recovery rate would be reported as 50%.

These differences in interpretation may skew the overall data when it is aggregated or make it difficult to compare across local governments. Such differences may lead to confusion and present a barrier to regional cooperation on resource recovery activities, principally because it becomes difficult to establish an appropriate baseline on which to compare existing systems.

'Benchmarking' is a common and useful way to measure the success of a particular program or for identifying opportunities to adopt programs and approaches already deployed by other groups. For example, in the case of a local council, the resource recovery rate achieved by a similar council through the use of one system may be compared with performance levels achieved by a council using another system, in order to identify which of those systems might be replicated.

Inconsistent baseline definition and classification systems can reduce the effectiveness of benchmarking, and in some instances may lead a group (whether a local council, or a jurisdictional government) to expend effort adopting a certain approach that may not have been as attractive had it been assessed against other alternatives using a common baseline. Thus, the impact of such inconsistencies can go beyond just data and reporting issues and impact on decisions regarding the sustainable management of waste.

Issues with waste classification systems at other levels (such as jurisdictional) can also have a significant impact on the management of waste at a local level. For example, section 6.3 discusses the Queensland experience in introducing a new classification system but failing to provide consistent advice and guidance to users who implement the system at the local level. In this example, different regional officers were providing differing interpretations of the classification system, leading to landfill sites in neighbouring areas making inconsistent decisions about the operation of their sites and the types of waste that they accepted. Such inconsistency can have a direct financial impact on site operations and potentially provide a commercial advantage to some sites over others, particularly where differential gate fees or landfill levies (or exemptions) apply to different categories of waste.

Key issues at a local level

The examples discussed in this section highlight the following key issues with respect to the impact of waste definitions and classifications at a local level:

- Inconsistencies in waste definition and classification systems can act as a barrier to cooperation between councils (or other parties) who may be seeking to jointly develop more efficient systems and infrastructure.
- In particular, the lack of an established national standard for waste audits, which would include a uniform set of waste classifications and definitions, can result in a time and cost impact associated with consolidating, interpreting and comparing waste data.
- Inconsistencies in baseline waste data, arising from the use of different classification systems, can impede (or at least increase the cost of) strategic regional planning of waste infrastructure.
- Within a given system, users may apply inconsistent interpretations, leading to data sets which are difficult to compare and consolidate.
- Attempts to measure the performance of particular approaches or programs using waste data (for example, through benchmarking), may be skewed by inconsistent waste definition and classification systems.

6.3 INTRA-JURISDICTIONAL (INTERNAL) ISSUES

Each Australian jurisdiction has developed its own waste definition and classification system(s) to suit its particular policies, functions and waste management practices. In some cases, these systems have evolved organically over time and tried to keep pace with changes in waste management practices. In other cases, existing policies and regulations were found to be inadequate and a more comprehensive overhaul and reform of classification systems has taken place as well as associated changes to data collection and reporting requirements.

The Queensland experience

In recent years, the Queensland Government has embarked on a program of reforming the state's waste legislation. The Queensland experience provides a timely and relevant case study on the issues that may arise when waste reforms are undertaken in the absence of an appropriate comprehensive waste classification system, and the difficulties encountered in developing and implementing a new classification system for a specific purpose.

Representatives from the Queensland Department of Environment and Heritage Protection (EHP, formerly Department of Environment and Resource Management, DERM) were consulted in the preparation of this report in order to develop a case study of these issues and share some key lessons learned through their experience.

Queensland's *Waste Reduction and Recycling Strategy 2010–2020* was published in 2010. The strategy set clear targets for diverting waste from landfill and resource recovery, and identified the introduction of a waste disposal levy as a key mechanism to drive that change.

The Waste Reduction and Recycling Act was passed into law in December 2011, translating some of the key measures from the strategy into legislation, including the introduction of a waste disposal levy as well as associated changes to data collection and reporting requirements in order to facilitate the levy's application. While this report does not seek to review or discuss issues associated with landfill levies in Queensland or other jurisdictions, the administration of a levy is one of many functions that classification systems may serve. The introduction of a landfill levy requires robust waste definitions and classifications and can be a major driver in shaping the development of those systems in jurisdictions where it is implemented.

The levy in Queensland was aimed at particular waste streams, with differential levy rates and a number of exemption categories. The primary targets for the levy were commercial and industrial waste, construction and demolition waste and regulated (hazardous) waste, with the latter being further classified as low or high hazard. Municipal waste was excluded from the levy, and a number of other exemptions were identified including disaster management waste (waste arising from the clean-up following natural disasters), asbestos and dredging spoil.

As such, the new system was heavily dependent on waste definitions and classifications. In order to implement the system, the classification of waste needed to be clearly defined in a manner that was manageable and easy to implement for all stakeholders including businesses, waste operators and local councils. In the absence of an established classification system that was suitable for this purpose, a significant part of the reform process involved the defining of a new system. The classification system was defined in the *Waste Reduction and Recycling Regulation 2011*.

Prior to the recent reforms, the Queensland classification system was focused on identifying and differentiating regulated waste from the general waste stream, with limited classification of waste by its source. The new waste definitions were developed specifically for the application of a waste levy to particular waste materials, which government policy at the time had determined should be subject to a financial instrument to discourage landfill disposal. This specific purpose shaped the classification system and the definitions had limited relevance to other functions.

Furthermore, a new data reporting system was developed around those classifications in order to enable administration and collection of the levy. The online reporting system was introduced for use by landfill operators to meet their obligations. Both the classification and reporting systems were heavily focussed on landfill disposal (the subject of the levy) and less attention was given to collecting data from recycling and reprocessing industries.

In March 2012, a change of state government brought a change in policy, and the waste levy was removed (the legislative framework remains, but all levy rates were set to zero). Hyder

understands that, at the time of writing, a Bill was being considered by parliament which, if passed, would fully repeal the levy component of the *Waste Reduction and Recycling* Act^{20} . However, the data and reporting requirements under the Act remain in place.

Without a levy, the current system has limited relevance to other functions. EHP is currently in the process of revising the waste definitions and developing a new classification system as well as revising the existing online data collection system. The intention is to integrate and streamline the various existing data collection and reporting systems and requirements to reduce the administration burden on operators. It is hoped that a simplified, more intuitive classification system will assist with this goal.

Specific issues with the Queensland classification system

The definition of 'commercial and industrial' waste in the Queensland regulations was particularly broad, given this was a primary target of the levy. It included waste streams that did not necessarily originate from typical commercial and industrial sources. One particular element of the C&I definition that caused concern for industry was the inclusion of residues arising from "sorting, resource recovery, reprocessing and recycling operation".

As such, if municipal waste, not originally subject to the levy, was processed through a resource recovery process such as a Materials Recovery Facility (MRF) or Alternate Waste Treatment (AWT) facility, any residuals from that process would be classified as C&I waste and then subject to the levy. While the intention was to drive recyclers and reprocessors to maximise recovery rates and prevent potential levy-avoidance loopholes, it was seen by many in the industry as potentially penalising operators of recycling facilities. The C&I definition was also inconsistent with some other jurisdictions in this respect.

As a result of industry concerns, the government introduced levy discounts for 'residue waste' arising from recycling activities²¹. Nevertheless, it is likely that the C&I waste definition had a direct impact on decisions to invest in new resource recovery infrastructure, particularly for the MSW stream, given operator uncertainty around the potential for increased operating costs at the time.

According to EHP staff, the introduction of the new classification system caused significant confusion among some operators using the system. The responsibility for applying the classification system fell onto landfill operators, with most day-to-day classification decisions taken by weighbridge operators.

Advice and interpretation was provided on a regional basis through EHP's regional branches. As a result of limited government resources and implementation timeline pressures, some inconsistencies developed across the regions and between individual facilities. According to EHP staff, there were cases where a landfill in one area was interpreting the classification system very differently to a landfill in an adjacent area. These inconsistencies had a direct impact on the operation of the sites and the types of waste they accepted, potentially resulting in commercial advantage to some operators.

²⁰ On 13 November 2012 the Queensland Minister for Environment and Heritage Protection introduced the *Waste Reduction and Recycling and Other Legislation Amendment Bill 2012* to the Queensland Parliament, which, among other measures, removes all references to the levy.

²¹ An existing AWT facility in Cairns, processing mixed municipal and commercial waste was granted a specific levy exemption for 63% of its residues while a general 50% levy discount levy was granted to 'residue waste' arising from a defined list of recycling activities for other facilities.

The availability of training and information on the new system was lacking, as was centralised, consistent advice. Guidelines were produced but were found to be inadequate, and eventually became irrelevant as regions developed their own interpretations.

Adding to the potential for errors was the fact that many small and rural landfill sites were required to install a weighbridge for the first time. Not only were they coming to terms with a new classification system, but they were not accustomed to using a weighbridge and the data it provides. The potential for errors at these sites was higher than at larger sites with established weighbridge and data recording systems.

Where classification of waste takes place at the final disposal point, clearly it becomes more difficult to identify the original source of the material. Under the current Queensland regulations, data and reporting requirements, and the associated classification process, are focussed on disposal sites. Specific regulations to define the data and reporting requirements through other waste management pathways are still being developed. Mixed loads are difficult to accurately classify and present a major issue for reporting, particularly in rural areas where domestic and commercial waste is regularly co-collected. Reporters were asked to define the relative proportions in each load, but no procedure was defined or guidelines provided, leading to further inconsistency.

The collection of data and reporting of onsite waste disposal is also inconsistent, but potentially significant. Generally, onsite disposal is excluded from data and reporting obligations in Queensland, with the exception of large power stations and some minerals processing facilities such as alumina refineries and smelters, which are required to report landfilling of ash and other residues. However, mine sites that landfill their own waste onsite, which may include a mixture of MSW from camps as well as C&I and C&D from operations, are not required to report waste disposal.

When it came time to collate the data from the levy period in Queensland, it was apparent to government stakeholders that there were significant issues with interpretation and use of the online reporting system. According to EHP staff, it took approximately three months to make sense of the data, requiring clarification with each of the reporters. This had an obvious time and cost impact for the government.

Key lessons from Queensland classification reforms

With the removal of the Queensland waste levy, the existing classification and reporting system that was developed in order to enable that major market reform, is still in place but now has reduced relevance, and the EHP is currently undertaking further reforms. A number of key lessons were identified, and will help shape the new system.

The online reporting system will still be used in a modified form and, based on feedback from industry and local government, the intention is that the data produced will be publicly accessible and released in a timely manner.

The main lesson of the Queensland levy experience was that classification systems must be simple and usable. The new classification system will identify waste by its source to align with national data reporting systems (for example NGER).

The new data and reporting system will also have wider coverage. Only disposal facilities are currently required to report, but it is intended that new regulations will define 'reporting entities' that will include transfer operations as well recyclers and reprocessors. The intention is to have a streamlined classification system and be able to track waste as it moves through different waste pathways, as well as identifying when it leaves the waste system (for example, by becoming a product).

It is recognised that more effort should go into information campaigns and training for reporters, as well as availability of consistent advice. EHP is also consulting with weighbridge software providers to ensure any new system is compatible with existing infrastructure.

EHP is also reviewing two key waste-related regulations with a view to streamlining wasterelated definitions, having identified a number of redundant terms.

The Queensland experience provides an interesting example of the challenges that arise when a jurisdiction is forced to develop a bespoke waste classification system, to suit its own particular purposes, where no such system previously existed. It also demonstrates that waste classifications can lead to complex issues that can have direct financial impacts on government and industry, and may impact on decisions to invest in new resource recovery infrastructure.

The Queensland experience is not unique. Other jurisdictions have been through similar reform processes and encountered similar issues. All jurisdictions will undoubtedly continue to develop their waste regulation in the future, and some may choose to embark on major reforms. Definition and classification systems form an important part of the baseline system for waste regulation and collection of data and reporting, and as such are an important consideration during any wider reform.

End-use markets

Each jurisdiction has developed slightly different approaches to defining when a waste material is no longer considered a waste and becomes a product or resource. As discussed in 4.2.1 above, this basic differentiation in definition can have a significant impact on efforts to recover resources from waste and markets for recovered products.

An example of this impact on markets and infrastructure development occurred in NSW in recent years with respect to organic outputs from the processing of mixed waste through an AWT system. AWT organic outputs are a form of low-grade compost derived from the organic fraction of mixed residual waste. Typically, the physical and chemical contamination rates are higher than in compost produced from source separated organic materials. The material can offer a number of potential benefits when applied to land as a soil amendment. However if the contamination is not adequately controlled it could potentially have an adverse impact on the environment, human health and/or agricultural products.

The ability to beneficially use AWT organic outputs is fundamental to realising the full resource recovery potential of the AWT process, which is intended to divert the maximum amount of waste and particularly organic waste, from landfill. Defining whether the material is a 'waste' or a 'product' significantly affects an operator's ability to market the material and secure suitable outlets for the product. This in turn, may be a significant or deciding factor in the overall financial viability of an existing or planned AWT facility. The alternative to land application and beneficial use would be to landfill the material and the cost of doing so would generally make it very difficult for most AWT projects to be financially viable.

In NSW, prior to the gazettal of a general resource recovery exemption²² in March 2010, AWT organic outputs were considered a 'waste' and their application to land was controlled by the regulator under the waste regulatory framework using Environmental Protection Licences (EPL). EPL's are specific to a site or activity and until the licence was issued, there could have been

²² General resource recovery exemption for organic outputs derived from mixed waste exemption, NSW EPA, updated March 2011.

uncertainty as to whether the EPL would be granted for a future project and what conditions may be attached to that licence.

A general resource recovery exemption however provides a clear and consistent standard for all operators, providing certainty as to the quality standards that must be achieved and the uses and market outlets that are appropriate for a given product.

In March 2010, a general exemption for AWT outputs was gazetted in an effort to provide that certainty. There was an issue in the implementation of that original exemption in that it included a 'sunset' clause which could have potentially limited certain applications in the future. This issue was subsequently addressed in a March 2011 revision of the exemption, thereby providing more certainty for operators around future uses.

Prior to that revision in May 2010, four southern Sydney councils cancelled their procurement process for a shared AWT facility. Media reports at the time quoted the uncertainty around the conditions of the exemption for AWT outputs and its associated conditions as a factor in the decision although it is likely that other factors played a role. In June 2010, the Southern Sydney Regional Organisation of Councils (SSROC), a group of six councils, also suspended its tender process for an AWT solution. Again, media reports indicated that uncertainty about markets for organic outputs was one of the factors, among others, in that decision.

The case demonstrates the impact that waste definitions and the implementation of exemptions within a jurisdiction can have on resource recovery activities. In the absence of a general resource exemption or similar mechanism, uncertainty about whether recovered products will be classified as a waste, and/or the avenues that may be available for their future use, can increase the risks and directly affect the financial viability of future resource recovery projects. As such waste definitions can ultimately contribute to the type of infrastructure that is developed. In the NSW AWT case, the issue has now been addressed and the current exemption provides improved certainty for AWT project proponents.

Key issues at an intra-jurisdictional level

The examples discussed in this section highlight the following key issues with respect to the impact of waste definitions and classifications within a jurisdiction:

- The absence of an established, consistent system of waste definitions and classifications, and the associated data and reporting systems, can be significant barrier to the implementation of waste reforms at a jurisdictional level.
- Waste definitions and classification systems which are developed to serve a specific purpose may have limited relevance or application outside of that function.
- Waste definitions and classifications can have a direct financial impact on governments and industry and may affect decisions to invest in new resource recovery infrastructure.
- Regulators should recognise that it is often frontline workers (for example weighbridge attendants) who actually implement classification systems and make day-to-day decisions on waste classifications. Therefore systems should be simple and user-friendly, compatible with data collection systems (for example weighbridge software) and must be accompanied by appropriate training programs and consistent advice.
- In the absence of adequate guidelines for a waste classification system, users may develop their own interpretations leading to inconsistency in data and significant time and cost impacts when consolidating and assessing the data.
- Waste definitions and associated exemptions which determine that a material is a resource, can have a direct impact, including financial impacts, on existing and future resource recovery infrastructure.

Re-use of materials is one area of particular confusion that is not always clear in waste definitions, as re-use can occur within and outside conventional waste management systems.

6.4 INTER-JURISDICTIONAL (BETWEEN STATES) ISSUES

The manner in which waste within a certain jurisdiction is managed, and the manner in which information about that material is required to be recorded and reported, is to a large extent determined by the legislation and regulations independently developed by that jurisdiction. It is well known that, despite Federation in 1901, Australia's early colonial history led to a number of differences between jurisdictions, including the example of varying rail gauges.

Similar to the varying rail gauges issue, different waste management and data and reporting systems may ably serve the direct requirements of their respective jurisdiction, but issues may arise when waste materials are transported across jurisdictional boundaries and when companies operate across more than one jurisdiction.

Cross-border waste management issues have been repeatedly highlighted by a variety of stakeholders in previous consultation processes. For example, in its submission to the *National Waste Policy* consultation process, the Australian Industry Group (which represents over 60 000 businesses) stated that policy differences (including definitions, fees and exemptions) between jurisdictions, "*means higher costs for administration, licensing, compliance and enforcement*"²³. Kimberley-Clark Australia, meanwhile, also noted that it "*manufactures in two states and has to manage its waste production, recycling, processing and disposal under different state requirements. This adds extra effort, which is wasteful*".²⁴

Management of waste

The right to free trade between the jurisdictions is protected by Section 92 of the Australian Constitution and, despite some data collection and reporting requirements in the case of hazardous materials, there are few restrictions on the cross-border movement of waste.

Given the growing differential between the waste disposal costs (including levies) in different jurisdictions, as well as increasingly specialised and sophisticated treatment systems being developed for managing specific waste types, there are increasing drivers for waste to be transported across jurisdictional boundaries. This increased movement of waste serves to highlight the regulatory and administrative issues associated with inconsistent jurisdictional waste definitions and classifications. As the scale of waste movements increase, so does the scale of the overall impact of these issues.

In relation to hazardous (controlled) wastes, empirical data demonstrates this trend toward increased cross-border movement. The *National Environment Protection Council (NEPC) Annual Report 2010–2011*²⁵, for example, shows a 54% increase in the tonnes of hazardous waste transported from NSW to Queensland between 2008–09 and 2009–10²⁶, followed by an

²³ <u>http://www.environment.gov.au/wastepolicy/consultation/submissions/pubs/068-aig.pdf</u>

²⁴ http://www.environment.gov.au/wastepolicy/consultation/submissions/pubs/020-kimberleyclark.pdf

²⁵ http://www.scew.gov.au/publications/annual-report/pubs/nepc-annual-report-2010-11.pdf

²⁶ <u>http://www.scew.gov.au/archive/annual-report/pubs/nepc-annual-report-09-10.pdf</u>

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89% increase in the tonnes of hazardous waste transported across that border, from 17 726 tonnes in 2009–10 to 33 504 tonnes in 2010–11. While the report does not provide an explanation for this increase, the differential in disposal costs and absence of a landfill levy in Queensland was likely to have been a major driver for this trend. Differences in the classification of wastes and the classification of disposal facilities may have also contributed.

Differing definitions can have implications for how a waste is managed and treated, which could potentially lead to a differential in human health and environmental impacts where the management standards differ across borders. For example, clinical waste in most jurisdictions includes items such as sharps, body parts and human tissue. However in relation to such medical waste as swabs, bandages and other cloth items, Queensland uses the following expression²⁷: "*discarded material saturated with, or containing free-flowing blood and other body fluid*". Whereas the *Protection of the Environment Operations Act 1997 (NSW)* defines this category as "*visibly blood-stained materials*".

So, for example, a bandage with a small amount of dried, visible blood could be classed as clinical waste in NSW, but not in Queensland. This would mean that the bandage would receive strict handling, transport and treatment in NSW, but would be treated as normal general waste in Queensland. This discrepancy could lead to significant differences in the handling of the same waste across the jurisdictions. The transport of such waste from NSW into Queensland for disposal, could also be seen as an opportunity to reduce the financial and regulatory burden associated with disposing of such wastes.

Inconsistencies in classifications can cause problems for companies transporting waste between jurisdictions. This can be seen in the detail of the *National Environment Protection (Movement of Controlled Wastes Between States and Territories) Measure* (Controlled Waste NEPM)²⁸, which was instituted in order to manage the interstate movement of controlled wastes. The *Controlled Waste NEPM* provides a list of 75 waste types, such as 'acidic solutions or acids in solid form', 'grease trap waste' and 'non toxic salts'. However, the *Controlled Waste NEPM* does not define codes to be used against these categories to assist with tracking administration purposes. This has resulted in each jurisdiction adopting a slightly different set of codes.

While NSW, Queensland, South Australia and Victoria use similar codes to track the movement of controlled wastes, some jurisdictions do not track certain waste categories, include additional categories, or use definitions that vary from those provided in the *Controlled Waste NEPM*. These differences are explored in detail in the *Liquid Waste Assessment* report (Hyder, 2012)²⁹ and a summary of the key differences is reproduced in Appendix C of this current report (Note: Hyder has amended the information for Western Australia in this table in light of an update to regulations in April 2012).

Transpacific Industries is a national waste operator active in transporting, treating and disposing of controlled wastes across a number of jurisdictions. Their submission to the *National Waste Policy* consultation provides an example of the issues that can arise from differences in the classification and coding systems:

"Inconsistencies in the coding of grease trap [wastes] have the potential to create confusion when grease trap from a generator in NSW is transported to a receival facility in Victoria. Grease trap is exempt from tracking requirements when transported within NSW, however is considered a

²⁷ From Waste Reduction and Recycling Regulation 2011 (Qld).

²⁸ <u>http://www.ephc.gov.au/taxonomy/term/46</u>

²⁹ <u>http://www.environment.gov.au/wastepolicy/publications/liquid-waste.html</u>

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controlled waste for the purposes of the Controlled Waste NEPM and as such requires tracking when cross jurisdictional borders. The waste classification system used in NSW, along with the systems used in Tasmania, SA and QLD, classify grease trap as K110. The Victorian systems however, only classifies grease trap as K110 when the waste has been generated from domestic premises. Should the grease trap waste being transported originate from industrial premises the consignment authorisation and relevant tracking documents would need to quote a waste code of K20 – Grease interceptor trap effluent - industrial."

These variances can place particular burdens upon companies operating between jurisdictions, for example, Transpacific Industries Group stated in their submission that the *"adaptation of a single IT solution that would service all States"* was practically impossible. Additionally, as commented by several stakeholders during consultation for this report, these inconsistencies in definition and coding increase the risk of incorrect disposal, trucks being turned away from a facility and/or prosecution under relevant environmental legislation. It was also commented that costs are incurred on receival facilities due to the employment of additional personnel to analyse wastes and ensure that the documentation matches the load material.

The level of confusion caused by these classification discrepancies appears to be reflected in the NEPC *Annual Report 2010–2011* which showed, for example, that 13.6% of all controlled waste movements into Queensland from South Australia during this period had 'non-matching documentation'.

Differing systems across jurisdictions, including the definitions and classifications systems, can also provide serious challenges for companies attempting to maintain compliance with jurisdictional environmental legislation.

An instance of this arises in the used lead acid batteries (ULAB) recycling industry. The requirements of most jurisdictional environmental legislation differ in terms of the waste classification type, storage limits and tracking requirements and codes that apply to this particular waste. For example, the Australian Battery Recycling Initiative (ABRI), in a submission to the Reducing Hazard and Risk Working Group, noted that in Western Australia ULAB is classified as 'solid waste' for storage requirements, but 'controlled waste' for transport purposes. South Australia, similarly, uses the 'waste solely for recycling or reuse' category for ULAB storage, but 'listed waste' for transport. Hyder understands that the Working Group is investigating this inconsistency but, at the time of writing, is not aware of the outcome. As stated by one stakeholder, these differences can make it difficult for businesses who are involved in the storage and transportation of ULAB to understand their legal responsibilities and also to ensure their agents are complying with the regulations. Non-compliance with regulations can lead to severe penalties and potential environmental impacts due to incorrectly managed hazardous waste.

Waste data and reporting

The extent to which jurisdictional differences reduce the ability to compare waste information, creates inefficiencies and inaccuracies in the collation and reporting of waste data and the use of that data. Many of these differences were explored in *Waste and Recycling in Australia 2011* (Hyder, 2012) which, for the first time, attempted to apply a consistent methodology to the assessment and reporting of waste and recycling information across Australia. The report is largely based on the extrapolation and use of jurisdictional data sets. Some key issues encountered in the development of *Waste and Recycling in Australia 2011* are outlined in Table 6-7.

Issue	NSW	VIC	QLD	SA	WA	TAS
Reporting of reprocessed agricultural wastes in recycling data	NSW reports agricultural waste received for reprocessing as a component of its organic stream.		Queensland reports manure and other agricultural wastes recovered.	South Australia includes waste from agricultural processes collected for reprocessing in the 'other organics' category.	Western Australia reports agricultural waste, excluding manures, collected for reprocessing.	
Reporting of landfill daily cover in landfill data	NSW counts soil, including daily cover, as waste disposed to landfill. Earth based material is reported as a particular material in the domestic waste stream. Soil is not reported separately from other C&D waste.	In Victoria, landfill operators are granted a fixed rebate equal to 15% of all "waste deposited onto land at the premises" to allow for daily cover. As a result, some data reported for Victoria regarding waste disposed to landfill is 15% less than the actual amount landfilled.	Queensland reports clean fill disposed to landfill as a discrete item. Queensland previously made allowances for daily cover, but no longer does so.	South Australia reports soil in combination with brick, tile and rubble. Clean fill is exempt from the landfill levy and is reported separately in the landfill levy accounts. No special accounting is made for daily cover.	Western Australia provides separate data on "sand, soil, clean fill and rubble" in its materials recovery reporting. In calculating the landfill levy, some landfill sites are able to make an allowance for daily cover of up to 8% of the waste received.	Tasmania excludes clean fill from landfill reporting and does not make any allowance for daily cover.
Biosolids	NSW reports biosolids, grit and screenings as a distinct material type in the composition of organic material received for reprocessing.	Victoria measures biosolids separately from other wastes, and reports on it separately to all other recycling and landfilling activity.	Queensland reports biosolids separately both in terms of material landfilled and material recovered.	South Australia excludes biosolids from its reported recycling.	Western Australia records biosolids that are collected for reprocessing, but reports them separately to other organic wastes.	

Table 6-7 Examples of differences in jurisdictional data reporting (from Waste and Recycling in Australia 2011 (Hyder, 2012))

One key difference that impacts on data reported at a jurisdictional level relates to the treatment of soil and landfill daily cover material. As outlined in Table 6-7, these materials are often classified differently between jurisdictions. NSW, for instance, classifies soil (or, clean fill) disposed to landfill as waste, however Tasmania does not classify soil as a waste for data and reporting purposes. *Waste and Recycling in Australia 2011* recommends that clean fill be excluded from the scope of waste and recycling reporting.

These types of inconsistencies can have a significant impact on waste data when aggregated across jurisdictions which can cause issues for governments and businesses attempting to use that data when formulating strategies and making planning and investment decisions.

For instance, as explained in Section 6.2, the benchmarking of performance between jurisdictions may be a key tool used in determining the most effective policy directions. In considering new approaches to waste management and in the planning of waste infrastructure, jurisdictions often utilise the lessons learned from prior experiences of other jurisdictions. Key waste data parameters, such as 'recovery rates' or 'per capita waste generation rates' may be used to assess the success or failure of a particular strategy or policy. Therefore, access to reliable and comparable information from other jurisdictions may inform the development of strategies and planning decisions. When Queensland was planning for the introduction of their waste levy, they used NSW diversion rates as a baseline to estimate their own expected diversion rates³⁰. Similarly, Western Australia benchmarked their recycling performance against other jurisdictions to assist in the setting of diversion targets in their 2012 *Western Australian Waste Strategy: "Creating the Right Environment*"³¹.

The *Inside Waste Industry Report 2011–12*³² (WME Media, 2011) attempts to rate the performance of each jurisdiction in terms of waste generation, landfill disposal and resource recovery. The baseline data used in the *Industry Report* was largely based on publicly available information, and the methodology was developed in order to provide indicative information for a broad readership group, rather than to support the decision making of any particular jurisdiction or stakeholder. Unfortunately, however, the baseline data used in compilation of publications such as the *Industry Report* is of limited accuracy, due in part to issues associated with the use of different definition and classification systems across Australia.

Several other stakeholders have noted that the lack of comparable data across jurisdictions may impact the market by hindering effective decision making. In the consultation to the *National Waste Policy*, Transpacific Industries Group commented that uniform definitions and classifications are needed to "*encourage innovation, and enable quantification of any waste related activities (including target setting)*"; while the National Timber Product Stewardship Group stated that differences between each state's environmental regulatory framework "*hinders those industry organisations wishing to develop and deliver national strategies and policies*" and "[*o*]*ngoing investment in recovery infrastructure is…dependent on having quality data*". Moreton Bay Regional Council said the introduction of national standards could provide, "*more confidence for strategic planning and making investment decisions*".

An indication of some of the costs to governments and industry of differing data sets is shown in a feasibility study³³ conducted by the Waste Management Association of Australia (WMAA) in 2008 and 2009. The study investigated the potential of creating and operating a national waste database (such as a potential revitalisation of the dormant Australian Waste Database project,

³⁰ <u>http://rti.cabinet.qld.gov.au/documents/2010/nov/qld%20waste%20reduction%20strategy/Attachments/ras.pdf</u> (p. 15)

³¹ http://www.zerowaste.wa.gov.au/media/files/documents/WA_Waste_Strategy.pdf

³² Hyder developed the Performance and Infrastructure chapter of the *Inside Waste Industry Report 2011–12*.

³³ This study has not been published.

discussed in Section 5). The proposed database would standardise definitions, classifications, data collection and reporting methodologies and provide a central point for the collation of data from all jurisdictions.

WMAA investigated various scenarios in the feasibility study, including mandatory reporting under legislation and voluntary reporting using different incentives. The scenario considered to have the most likelihood of success was then the subject of a cost-benefit analysis against the baseline of 'doing nothing'.

The approach to costing the potential impact of a national waste database was based on the estimated labour (work hours) required for local government and waste industry operators to complete various waste data surveys, and for data collectors to administer those surveys. The approach did not consider other administrative and managerial costs caused to companies by the duplication of data systems across jurisdictions.

The WMAA feasibility study found that, in the first 5 years, the implementation of a national waste database could potentially provide councils and waste industry operators cost savings in the vicinity of \$4-5 million in the first year compared to the baseline, and then approximately 60-70% of this sum for each succeeding year³⁴.

Key issues at an inter-jurisdictional level

The examples discussed in this section highlight the following key issues with respect to the impact that waste definitions and classifications can have across jurisdictional borders:

- Inconsistency in waste classifications between jurisdictions may lead to differences in the degree of management and environmental protection applied to particular waste streams based on their disposal location.
- Inconsistency in waste definitions and classifications between jurisdictions, coupled with inconsistent hazardous waste coding, can lead to confusion and increased risks in the cross-border transport of hazardous waste, including incorrect disposal or treatment, inaccurate documentation, rejection of materials at the facility gate or regulatory action against those involved.
- The lack of comparable data across jurisdictions can impede waste reform, strategic planning and infrastructure investment decisions.
- Streamlining national waste data, including consistency of definitions and classifications, will result in significant financial savings across governments and industry.

6.5 NATIONAL ISSUES

Waste information which is used at the national level is mostly derived by aggregating waste data recorded at the local level which is passed on to the Commonwealth by the jurisdictional governments. Some data is collected by private industry, collated by industry groups and reported to jurisdictional governments or directly to the Commonwealth. Local data quality therefore, regardless of the source, has major significance to national waste planning and data and reporting activities. This report discusses how inconsistent waste definitions and classifications directly contribute to issues of waste data quality at a national level.

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³⁴ The WMAA cost-benefit analysis was comprehensive in its coverage of local governments and private sector waste facilities. However, it could not cover all potentially impacted stakeholders so the analysis is likely to under-estimate the total benefit.

The Australian Government has many waste-related reporting obligations at both the international and domestic levels, such as international hazardous waste movements under the Basel Convention and greenhouse gas emissions under the *National Greenhouse and Energy Reporting (NGER) Act 2007.* The data used in these reports mostly originates from individual operators, local governments and other entities. In the case of data reported under the Basel Convention, it is first collated by the jurisdictions and then passed to the Commonwealth.

International reporting obligations

A report entitled *Review of Australia's international waste-related reporting obligations* (SKM, currently in draft) reviews Australia's international reporting obligations and examines the gaps in the information available to fulfil the reporting requirements.

The report identifies that Australia is signatory to 13 international treaties and Conventions which require mandatory or voluntary data reporting on various waste-related activities. These include the Basel Convention, the Stockholm Convention on Persistent Organic Pollutants, the Organisation for Economic Co-operation and Development (OECD) Member Reporting Requirements, and the Kyoto Protocol to the United Nations Framework Convention on Climate Change. SKM (p.8-9) identified that the key data required under these obligations includes:

- Action taken to minimise the generation of waste
- Disposal / recovery facilities operated, including capacity
- Total amount of waste generated
- Amount of waste imported / exported
- Action taken to minimise the generation of hazardous waste
- Total amount of hazardous waste generated
- Total amount of hazardous and other waste generated, by type
- Total amount of hazardous waste imported/exported
- Amount of hazardous waste and other waste sent to recovery and disposal
- Municipal waste generated
- Amount of municipal waste destined for treatment, disposal and recovery
- Generation of waste by industry sector
- Amount of waste generated, recovered, recycled by waste stream (for example C&D) or product (for example WEEE)
- Amount of non-hazardous waste going for recycling, compositing, incineration or landfill disposal
- Split of municipal waste from household and other municipal wastes
- Waste to landfill, wastewater & waste incineration related emissions of greenhouse gas
- Reporting against collection type
- Composition of municipal waste.

A summary of the main data required to fulfil a number of Australia's key reporting obligations is included in Appendix D. It should be noted that the data list above and the information in Appendix D was in draft form at the time of review by Hyder and may be subject to change in the final published version of the SKM report.

The data list above demonstrates the type of data that is reported by Australia internationally. Australia's international reporting obligations require the provision of data and information originating from a variety of sources, including local governments, site operators and industry. This data is often collected based on differing definitions, classifications and data collection methods. The SKM report considered the general quality of current data against some commonly recognised principles of data quality, and found significant deficiencies.

Of particular relevance to waste definitions and classifications, the *comparability* of data was found to be an issue. Comparability of data requires that the data is 'produced by the same methodologies'. SKM notes that data methods differ significantly across jurisdictions, primarily as a result of differing waste definitions and classifications. As noted in 6.3 above, data quality issues can also arise within a jurisdiction as a result of different interpretations of waste definitions and classifications the comparability issue.

SKM also noted issues with the *clarity* of data. Clarity requires that information is understandable and accessible but significant time and resource costs arise when users attempt to combine and aggregate waste data that is based on inconsistent definitions and classifications, leading to a lack of data clarity.

The other main issue raised by SKM that relates to waste definitions and classifications was that of *completeness*. Completeness requires that all waste sources are accounted for, yet inconsistencies in the definitions of waste result in gaps when waste data from jurisdictions is aggregated.

More specifically, SKM undertook a data quality assessment of the key data required under the international reporting obligations (see the summary table in Appendix E). It found that for some categories, such as 'generation of waste by industry sector', that little or no data was available. For the 'composition of municipal waste', it was found some jurisdictions had conducted kerbside audits, but audit methodologies and classifications were inconsistent. For the 'total amount of waste generated', it was noted that some 'apples-to-oranges' differences exist between jurisdictions as a result of inconsistent systems.

Review of Australia's international waste-related reporting obligations (SKM, currently in draft, p.18) summarises the issues resulting from the lack of a nationally consistent set of definitions and classifications as follows:

"A standardised classification and terminology for waste is necessary for managing, monitoring, collecting data, and for national and international reporting. Inconsistent waste classifications and terminologies contribute to data gaps and data bias and make it difficult to aggregate and report data. The lack of a common language also decreases the usefulness of shared information and makes it difficult to evaluate outcomes of projects, policies, laws and business transactions. It can also discourage resource recovery."

National Greenhouse and Energy Reporting

The National Greenhouse and Energy Reporting (NGER) Act 2007 was introduced by the Commonwealth as a framework to monitor and report on the annual greenhouse gas emissions, energy production and energy consumption of Australia's largest energy consumers, producers and greenhouse gas emitters; and contribute to the Commonwealth's fulfilment of Australia's international obligations to collect and report a national inventory of greenhouse gas emissions.

The NGER system now also serves as the basis for determining liabilities under the carbon pricing mechanism (CPM) introduced through the *Clean Energy Act 2011*.

In relation to the solid waste sector, greenhouse gas emissions from the operation of landfill facilities may be required to be reported under NGER, and may contribute to a liability under the CPM.

The National Greenhouse and Energy Reporting (Measurement) Determination 2008 (NGER Determination) sets out the approved procedures for estimating emissions from a landfill facility. The NGER Determination was drafted in response to international emissions reporting requirements and the provisions of the Determination were drafted with reference to the *International Panel on Climate Change* (IPCC) *Guidelines for National Greenhouse Gas Inventories.* The NGER calculation methods are therefore underpinned by the National Greenhouse Accounts, which comply with requirements under the Kyoto Protocol and United Nations Framework Convention on Climate Change (UNFCCC), to which Australia is a party.

Under the NGER Determination, the total waste received at a landfill is apportioned to three waste streams: municipal solid waste (MSW), commercial and industrial waste (C&I) or construction and demolition waste (C&D). Within each of the three waste streams (MSW, C&I and C&D), the total volume of each waste mix type can be estimated in order to identify the three key parameters for the calculation of greenhouse gas emissions from solid waste disposal: degradable organic carbon content; the fraction of degradable organic carbon dissimilated; and the methane generation constant.

It is noted that in some circumstances default composition data may be used if site-specific composition data is not collected. The NGER calculation requires the relative proportions of the following types of waste:

- Food
- Paper and paper board
- Garden and park (green)
- Wood and wood waste
- Textiles
- Sludge
- Nappies
- Rubber and leather
- Inert waste (including concrete, metal, plastic, glass)

The classification system enacted in the *NGER Determination* is focussed on differentiating and quantifying those waste components which contain degradable carbon and therefore contribute to greenhouse emissions from a landfill. There is no need to distinguish between inert waste materials containing no degradable carbon for NGER reporting such as metal, plastic, glass and concrete. Such differentiation is essential for other functions however, such as understanding material flows and potential resource recovery opportunities for residual waste.

Therefore the *NGER Determination* establishes an additional waste classification system that landfill operators must implement, which may or may not share common elements with other existing jurisdictional classification systems including waste audit standards. The NGER classification system is a further example of a system which has been designed to suit a specific purpose (quantifying the sources and amounts of degradable carbon deposited in a landfill), but may have limited relevance to other purposes.

Implementation of national schemes

Stakeholders consulted during development of this current report suggested that impaired data quality, due to inconsistencies between jurisdictional approaches at the baseline level of definition and classification systems, impacts the ability to make sound policy and investment decisions. National initiatives such as the *National Television and Computer Recycling Scheme* require robust national data-sets in order to facilitate good decision-making in relation to target setting, and several additional national initiatives are expected to be developed in the coming years, following passage of the framework legislation in the *Product Stewardship Act 2011*.

The National Packaging Covenant, which provides a framework for industry and governments to reduce the environmental impacts of consumer packaging, is another example of a national initiative in which targets have been set based on available data. The Australian Food and Grocery Council, in its submission to the National Waste Policy consultation, called for a "focus on improving national data and its management to ensure policy initiatives can be evidence based". It provided the following example to illustrate the need for improved national data:

"The National Packaging Covenant demonstrates the need for clear and robust data to allow the setting of targets against which progress will be measured. Aspirational targets including 65% of all packaging to be recycled by 2010 were included as part of the Covenant from 2005 to 2010. The data on which the original target was based was inaccurate and subsequent investigation revealed the baseline was in fact lower than what was originally thought. Fortunately for the Covenant and packaging supply chain, this issue has been largely corrected via a cooperative and constructive process that is provided for within the National Packaging Covenant. The issue however demonstrates the risks involved in both setting targets for waste management, but also specifically relying on less than perfect data as the basis for target setting and highlights the need for improved and accurate methods of collecting and aggregating data on waste."

National training and accreditation

The section above highlights some examples of the issues that inconsistent waste definition and classification systems may present to organisations which operate across multiple jurisdictions. Consideration should also be given to the fact that individual stakeholders involved in the waste sector may also move between jurisdictions during their careers.

One of the stakeholders consulted during this project has, in the last 3 years, held senior waste management positions for local governments in three different states. This has necessitated a degree of additional re-skilling in each role in order to overcome barriers such as the fact the definition of terms such as a 'Class II landfill' means different things in different jurisdictions, with different licenses conditions applied and very different materials allowed for disposal.

As an example of the above, a 'Class II' landfill in NSW is restricted to accepting non-putrescible general solid waste (inert waste) while a 'Class I' landfill is able to accept putrescible general solid waste. In Western Australia, however, the opposite is the case, with a 'Class II' landfill able to accept putrescible waste, while a 'Class I' landfill is restricted to accepting inert waste.

While the above example of different jurisdictional terminology may appear semantic and there may not be an especially large challenge for a specific individual to re-learn key waste definitions in order to do the same work in different jurisdictions, it does reduce the efficiency of the national market.

The 'usability' of definition and classification systems should be a primary consideration during design of such systems. Developers need to appreciate that the user who actually applies a classification system may be an individual who has had little formal training, and may be sitting

in a weighbridge shed at a relatively isolated facility. Some of the finer points of waste definition and classification that are considered particularly important by system developers may not be accurately implemented if the end user is not well placed to understand and implement the resulting system.

During consultation undertaken for this current project, one provider of waste industry training in NSW estimated less than 5% of workers in the sector might receive formal external training, including some coverage of definitions and classifications, while others may receive varying degrees of internal training.

In Victoria, the EPA requires all drivers of vehicles containing prescribed industrial waste (hazardous waste) to undertake training that has been approved by the Authority Regulation 15(c)(iv) of the *Environment Protection (Industrial Waste Resource) Regulations 2009.* The Victorian Waste Management Association (VWMA) provides a 1-day training course, which includes a module titled, 'EPA Waste Codes and understanding them'.

The increasingly sophisticated nature of the Australian waste industry, however, generally requires a higher level of training for operators, who are the front line in classifying the waste presented to them, and ensuring it is appropriately managed. But the development of effective training programs for operators is complicated by a lack of harmonisation between existing jurisdictional systems.

One of the major providers of accredited waste industry training, consulted during development of this report, confirmed that cost is a major barrier to some employers providing accredited training for their staff, and that a large portion of the fee charged for providing waste management training is associated with development and continual updating of course material.

Despite providing a nationally recognised qualification, based on the same standard package of core topics and the same competencies for those who complete the training, a course such as the *Certificate III in Asset Management – Waste Management* requires different material to be developed for each individual jurisdiction in order to reflect various differences, especially those related to waste definition and classification.

The largest uptake of formal training systems for waste staff comes from the major private waste companies, as well as those councils which rely on internal day labour. In the case of the private operators, one issue is that it is not possible for staff in different jurisdictions to receive exactly the same training, a barrier for those companies seeking to roll out consistent training to all staff.

Key issues at a national level

The examples discussed in this section highlight the following key issues with respect to the impact that waste definition and classifications can have at a national level:

- The aggregation of data that has been provided on the basis of inconsistent definitions, classifications and data collection systems can lead to significant data quality issues and impact on the comparability, completeness and clarity of nationally available data.
- For companies that operate in a number of jurisdictions, the differences in definitions and classifications can increase the cost of compliance with national legislation.
- Jurisdictional differences may add to the confusion and administrative burden associated with the implementation of key national policies.
- The development and implementation of effective training programs for operators is complicated by a lack of harmonisation between jurisdictional systems.
- Whilst the National Waste Policy does not establish targets, other national programmes do, such as the National Packaging Covenant and other initiatives under the Product Stewardship Act. In such cases, the setting of targets and monitoring of progress across

jurisdictions should be based on accurate and consistent baseline data, which can be difficult to achieve if the classification systems used for data and reporting in each jurisdiction do not consistently identify waste volumes in appropriate categories.

 Robust national data-sets are required to support sound policy decisions and the implementation of initiatives across jurisdictions.

7

GAPS AND OPPORTUNITIES FOR HARMONISATION

Strategy 4 of the *National Waste Policy* commits the Australian Government to work with the States and Territories to develop a nationally consistent system of waste definitions and classifications. Previous chapters of this report have identified a raft of differences between the existing systems that are currently in use across Australia. A number of examples have been identified which demonstrate the variety of issues and impacts caused by these inconsistencies.

The practical implementation of a nationally harmonised system will be an enormous challenge. The purpose of this current chapter is to identify any gaps in the existing systems and potential opportunities to address the key issues that have been identified. This is not intended as an exhaustive list of all opportunities for harmonisation, or a list of priorities for action, but rather some potential options to be considered by decision-makers in the implementation of Strategy 4.

7.1 GAPS IN EXISTING SYSTEMS

The current project has identified some gaps in the existing waste definition and classification systems which could be addressed in any nationally harmonised system. Gaps identified in the current systems are detailed below.

Re-use of waste

Many of the existing waste definitions do not adequately define the re-use of materials, particularly when it occurs outside of conventional waste management systems. This report identifies an example where the courts were called on clarify the definition of waste in a case where the material (source separated rubble) was 'wanted' for immediate use for another purpose (construction of a road). Such definitional issues create uncertainty and confusion and may constrain resource recovery activities.

Mixed loads

The Queensland case study in this report identified that some waste classifications do not adequately deal with the issue of classifying loads of waste from mixed sources. In the absence of a procedure specified within the classification system, users will develop their own methods and interpretations, leading to inconsistency in data from different users.

Guidance and advice

Examples presented in this report have demonstrated the need for consistent and comprehensive guidance for the implementation of classification systems. In the absence of adequate guidance and consistent advice, users will apply their own interpretations in conducting waste classifications.

Materials not well covered

Some existing classification systems and associated data and reporting systems, do not consistently address certain materials unless they specifically enter conventional waste management system (disposal and recovery facilities). An example is disaster management waste. The waste arising from the clean-up operations following a natural disaster (such as flood, cyclone or bushfire) can be presented to disposal facilities, in very large quantities over short period of time. Often there is no time or resources available to separate or properly classify the waste, yet the human health and environmental impact of inadequate disposal can be significant. Residues from bushfires can contain toxic compounds of combustion; waste from damaged buildings may contain asbestos and flood affected waste may present a bio-hazard from the release of raw sewage into floodwaters.

Attempts within *Waste and Recycling in Australia 2011* (Hyder, 2012) to apply a consistent methodology to the assessment and reporting of waste and recycling information across jurisdictions, highlighted a number of materials which are not covered consistently by existing systems. Examples include primary production waste from mining, forestry, agriculture, power production, as well as clean fill and dredging spoil.

7.2 OPPORTUNITIES

This report has confirmed the findings of various previous reports, which is that there would be significant benefits for industry and governments in the implementation of a nationally harmonised system of waste definitions and classifications. The issues identified in this project suggest a number of opportunities to both improve current systems and shape any future harmonised system. Some of the key opportunities are described below.

7.2.1 Consistency in resource exemptions

Integral to any system of harmonised waste definitions and classifications should be a harmonised system of resource exemptions or approvals which define when a waste is no longer a waste. Such mechanisms are critical to markets for recovered resources and the viability of resource recovery activities.

7.2.2 Guidelines for waste auditing

Several jurisdictions have developed waste auditing guidelines, which are aimed at improving the consistency of baseline waste composition data collected within the jurisdiction. Such waste auditing guidelines enact and contain waste definitions and classifications specifying the waste streams and material types that should be differentiated and reported. The results of such audits will often feed into other classification systems but may not be consistent across jurisdictions and may not always be suitable for other purposes, such as NGER reporting.

Development of some form of nationally agreed and harmonised best practice waste auditing guidelines may be of significant value in improving the quality and comparability of baseline data collected across Australia.

The material types and categories developed in order to enable consistent reporting of national waste and recycling data for *Waste and Recycling in Australia 2011*, and future reports in that series (including *Waste and Recycling in Australia 2012*, which is currently in production) could provide the basis for further development of a national approach to baseline waste auditing.

7.2.3 Usability of systems

In relation to waste and recycling data, the Australian Government generally relies on the jurisdictional governments to provide it with the best available information. The jurisdictional governments, meanwhile, generally rely on the operators of the various treatment and disposal facilities to provide them with the best available information. The operators of these various facilities generally rely on operational staff, such as weighbridge attendants, to undertake the best possible assessment of incoming materials, and accurately record that information. Operational staff, such as weighbridge attendants, commonly rely on the waste transporter or waste generator to provide accurate information about the properties of incoming materials, especially when they present as mixed loads.

Following this data flow back up the chain, it is obvious that a critical factor in improving the quality of waste and recycling data throughout the system is ensuring that classification systems are easy and intuitive to use for front-line, operational staff.

7.2.4 Consistent guidance and training

Following on from the issue above regarding usability of systems, frontline operators must have access to consistent and comprehensive guidance and training to implement the definition and classification systems.

Experience in the Queensland case study demonstrates that, in the absence of consistent, clear guidance, users will inevitably develop their own interpretation of classification systems which will affect the comparability of data.

In recognition of this issue, in 2008 the NSW Government over-hauled its *Waste Classification Guidelines*³⁵ in order to increase usability through development of a 'step by step' system. The guidelines include a list of 'pre-classified' wastes, clearly showing how commonly generated wastes should be classified. For example, 'food waste' is classified as General solid waste (putrescible) while 'garden waste' is General solid waste (non-putrescible).

Development of a similar national step-by-step user guide may help fill a gap in the current framework, especially by including a pre-classification system that allows users to relate commonly-encountered materials to the relevant risks and important characteristics.

7.2.5 Alignment of waste and facility classifications

Classifications for waste materials, should as far as practicable, be aligned to classification systems applied to waste management functions including transport systems, treatment and recovery facilities, and disposal facilities. There is some degree of alignment in some jurisdictions between waste classifications and landfill classification systems.

7.2.6 Consistency in scope

Waste definitions should be consistent in their scope and coverage. As noted above, classification approaches vary to materials such as disaster waste, primary production waste (mining, forestry, agriculture and power production), clean fill and dredging spoil. Definitions

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³⁵ http://www.environment.nsw.gov.au/waste/envguidIns/index.htm

should also address wastes which are managed on-site and outside conventional waste management systems, such as occurs on mine sites and minerals processing facilities.

7.2.7 Alignment with international reporting

Any new harmonised definition and classification system should adequately address the data requirements to fulfil Australia's international reporting requirements. The report entitled *Review* of *Australia's international waste-related reporting obligations* (SKM, currently in draft) identifies a number of issues with the data currently collated by the jurisdictions and used to report under the Basel Convention. While a harmonised system of definitions and classifications should help address many of the existing data quality issues, the report identifies a number of categories of waste information which are not addressed in current classification systems for data and reporting purposes.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 CONCLUSIONS

This report has confirmed what various previous reports have identified – that there are a number of issues that arise for industry and all levels of government as a direct result of the inconsistent waste definitions and classification systems across jurisdictions.

Waste definition and classification systems are used by a range of stakeholders and for a variety of purposes across Australia, including in relation to the management and regulation of different waste materials, the collection and reporting of information about waste and recycling activities and to ensure that hazardous wastes are appropriately managed to minimise their potential impact on human health and the environment.

This report brings together key issues identified in previous work for the department, from various public consultations and through Hyder's own stakeholder consultation as part of this project. One of the main objectives of the project was to gather more detailed information related to specific key issues including real examples and case studies that provide an up-to-date evidence base to assist decision makers in consideration of options for developing a national definition and classification system for wastes.

A number of such examples have been identified and discussed with stakeholders where possible.

Purpose and function of definition and classification systems for waste

The purpose of definition and classification systems is to assist users to understand the characteristics of waste. As an increasingly detailed understanding around the different degrees of environmental, social and economic risks associated with various types of 'waste' has developed, a variety of systems have been established to differentiate between materials. The design of these systems is heavily influenced by the intended function and this has led to the establishment of a variety of different systems within and between each Australian jurisdiction.

Many definition and classification systems have been developed to satisfy data and reporting functions, which provide the data on which industry and all levels of government jurisdictions monitor the performance of waste management systems. Other definition and classification systems primarily serve a management function, determining which particular management

options are appropriate for a given material or identifying when a particular material should be treated as a useful resource. A number of classification systems have been developed specifically to identify hazardous wastes and determine the appropriate management controls, given their increased potential to cause environmental harm or damage human health.

With so many different definition and classification systems in use, some of which may be open to interpretation, it is foreseeable and understandable that the same material could be defined and classified differently depending on the purpose of the classification, both within a jurisdiction and across jurisdictional borders.

Classifications can also extend beyond the actual substances themselves. Different classifications are often applied throughout the various waste pathways including collection, transport, treatment, recovery and disposal. For example, most jurisdictions have developed classification systems for landfill facilities which dictate the minimum engineering and environmental protection standards that are appropriate to minimise the risks associated with the waste being deposited.

Similarities and differences between existing systems

In order to demonstrate examples of similarities and differences in existing waste definitions, this report considers the over-arching jurisdictional definitions for a selection of key terms, being 'waste', 'hazardous waste', 'resource' and 'resource recovery'.

Where the terms are defined, each jurisdiction has generally adopted its own unique definition. Even where there are some similarities in the intent of the definitions, different wording has been adopted which results in subtle differences in the application of legislation.

This report has identified different approaches to defining when 'a waste is no longer a waste'. Such definitions and the associated resource approvals can have a significant impact on markets for waste derived resources and the viability of the recovery activities that produce them.

While the terms 'waste' and 'hazardous waste' have been defined by each jurisdiction, there is a general lack of reference to the terms 'resource' and 'resource recovery' in the over-arching legislation of many jurisdictions. This may reflect different approaches to regulation and control in the jurisdictions, or the reality that terminology changes over time. Terms such as 'resource' and 'resource recovery' feature more prominently in the statutory vocabulary of states which have significantly reformed their waste legislation in recent years.

This report finds, as have several other reports before it, that there are indeed considerable inconsistencies in relation to the existing waste definition and classification systems used in Australia. By reviewing former public submissions, and through direct interaction with selected stakeholders for this project, this project has identified specific examples of issues arising from these inconsistencies.

Impact on markets

This report has identified that each jurisdiction has developed slightly different approaches to defining when a waste material becomes a product or resource. Examples have been identified which illustrate some of the issues associated with existing and historic exemption systems to identify when a material is a resource or product.

The example of the issue of AWT outputs in NSW demonstrates how, in the absence of clear and unambiguous waste definitions (in this case, in the exemption), uncertainty around waste definitions can undermine efforts to develop new resource recovery infrastructure. It also demonstrates the role that definitions can play in enabling waste resources to be beneficially utilised.

Impact on waste data and reporting

This report has identified that the lack of harmonised waste definitions and classifications has an impact on waste data and reporting for all levels of government and industry. At a local level inconsistencies in baseline waste data, arising from the use of different classification systems, can act as a barrier to cooperation between councils (or other parties) and impede (or at least increase the cost of) strategic regional planning of waste infrastructure.

At a jurisdictional level, a lack of comparable data across jurisdictions can impede waste reform, strategic planning and infrastructure investment decisions. At all levels, attempts to measure the performance of particular approaches or programs using waste data (for example, through benchmarking), may be skewed by inconsistent waste definition and classification systems.

This report has also identified examples that demonstrate that even within a given system, in the absence of consistent guidance, users may apply inconsistent interpretations, leading to data sets which are difficult to compare and consolidate. Local data quality, regardless of the source, has major significance to jurisdictional and national waste data and reporting activities.

Impact on Australia's international obligations

Australia's international reporting obligations require the provision of data and information originating from a variety of sources, including local governments, site operators and industry. This data is often collected based on differing definitions, classifications and data collection methods. The *Review of Australia's international waste-related reporting obligations* (SKM, currently in draft) considered the general quality of current data against some commonly recognised principles of data quality, and found significant deficiencies.

In particular, the report finds that significant issues of comparability, completeness and clarity of the waste data exist as a result of inconsistent waste definitions and classifications and the varying interpretations of those systems. The report also identifies a number of waste category elements which are not adequately addressed in existing classification systems.

Gaps in existing systems

This project has identified a number of gaps in existing waste definitions and classification systems. These include gaps in current waste definitions with respect to re-use of waste materials, particularly outside of conventional waste facilities. This is an area of particular confusion which creates uncertainty and may constrain resource recovery activities.

Another gap identified is with respect to the classification of mixed loads of waste from various sources. In the absence of clear definitions and guidelines, users will develop their own interpretations and classification systems for mixed loads leading to inconsistency. Also, some jurisdictions do not provide consistent and comprehensive guidance for the implementation of classification systems. Experience shows that in the absence of adequate guidance and consistent advice, users will apply their own interpretations in conducting waste classifications.

Finally, existing systems do not cover certain materials very consistently such as disaster waste, waste from primary production (mining, forestry, agriculture, power production), clean fill and dredging spoil.

8.2 RECOMMENDATIONS

This project has not set out to provide an exhaustive list of all potential issues with existing waste definition and classification systems, nor to design a model for a nationally harmonised system. However, a number of specific issues have been identified and developed through
consultation with stakeholders and particular gaps and opportunities have subsequently been identified.

It is recommended that, in implementing Strategy 4 and 16 of the *National Waste Policy* and developing a harmonised system of waste definitions and classifications, decision makers consider the issues, gaps and opportunities highlighted in this report. The key opportunities for a nationally harmonised system identified in this project are:

- Consistency in resource exemptions a harmonised system of resource exemptions or approvals should be integral to any new system to define when a waste is no longer a waste. Such mechanisms are critical to markets for recovered resources and the viability of resource recovery activities.
- Guidelines for waste auditing various existing waste auditing guidelines are not currently consistent across jurisdictions and may not be suitable other purposes, such as NGERs reporting. Development of some form of nationally agreed and harmonised best practice waste auditing guidelines may be of significant value in improving the quality and comparability of baseline data collected across Australia.
- Usability of systems given that most waste classification is conducted by frontline operational staff (such as weighbridge operators) classification systems must be easy and intuitive to use.
- Consistent guidance and training following on from the issue above regarding usability of systems, frontline operators must have access to consistent and comprehensive guidance and training to implement the definition and classification systems.
- Alignment of waste and facility classifications classifications for waste materials should, as far as practicable, be aligned to classification systems applied to waste management functions including transport systems, treatment and recovery facilities, and disposal facilities.
- Consistency in scope the scope and coverage of waste definitions should be consistent across jurisdictions. Existing classification approaches vary to materials such as disaster waste, primary production waste (mining, forestry, agriculture and power production), clean fill and dredging spoil.
- Alignment with international reporting any new harmonised definition and classification system should adequately address the data requirements to fulfil Australia's international reporting requirements.

It is clear from the many issues identified in this report that waste definitions and classifications is a complex subject. While most stakeholders agree that there would be great benefits in a nationally harmonised system, the implementation of such a system will be an enormous challenge requiring the support of all jurisdictions.

In an ideal world, a single, simple waste classification system would serve all purposes. In reality, that could be very difficult to achieve. The more functions that the system attempts to address, the more complex the system is likely to become. The more complex the system, the greater the burden placed on frontline users.

Regardless of the model adopted, it is clear that a nationally harmonised system for waste definitions and classifications will benefit the whole waste management industry.

APPENDIX A

KEY STAKEHOLDER LIST

NB: the following organisations were directly invited to comment, but provided varying levels of input. Academy Green - Sustainable Learning ACE Waste Australian Battery Recycling Initiative Australian Council of Recyclers Australian Industry Group Australian Landfill Owners Association Cement Australia **Cement Industry Federation** Clean Energy Regulator Council of Roeburn, Waste Services Department of Climate Change and Energy Efficiency Department of Sustainability, Environment, Water and Communities – Product Stewardship Group EPA New South Wales (Waste Reform) EPA South Australia (Waste Resources) EPA Tasmania (Waste Management Section) National Waste Policy Working Group - Markets and Standards Queensland Department of Environment and Heritage Protection, Waste Reform Team Southern Waste Solutions **Transpacific Industries Group** WA Department of Environment and Conservation Waste Contractors and Recyclers Association of NSW Waste Management Association of Australia, Biohazard Waste Industry Group Waste Management Association of Australia, Queensland Branch Waste Management Association of Australia, Tasmania Branch Waste Management Association of Australia, Victoria Branch Waste, Recycling Industry Association (Queensland) (WRIQ) Zero Waste South Australia

Table 8-8

Key stakeholders contacted for this project

APPENDIX B

WASTE CLASSIFICATIONS IN AUSTRALIA (HYDER, 2012) TABLE 3-4

The table below identifies the key data collection and reporting pathways in each jurisdiction. Each data collection and reporting system incorporates its own, or relies on a waste classification system to differentiate waste streams and materials. Some of that data feeds into national data and reporting systems. Inconsistencies in those classification systems may lead to difficulties in comparing data across jurisdictions.

Table 8-9From, Waste Classifications in Australia (Hyder, 2012)

Table 3-4 - Summary of data collection pathways, responsible bodies, and purpose of data collection within each Australian jurisdiction

Jurisdiction	Government Body	Key jurisdiction-wide waste data collection pathways, requiring the implementation of classification systems	Primary purposes / end-uses of the information
New South Wales	Office of Environment and Heritage (OEH)	 Annual Survey of Local Government (waste and resource recovery) Monthly reporting by licensed waste facilities in the Regulated Area (SMA, ERA and RRA)³⁶ Annual reporting by licensed waste facilities in non-regulated areas All data from household Chemical Cleanout program Transport certification data on Controlled Hazardous Waste Several reprocessing industry surveys for select material categories in C&I and C&D waste streams (part-funded or undertaken on behalf of OEH) Litter survey (undertaken by Keep Australia Beautiful) 	 Primary reasons for data collection: Payment of landfill levy under section 88 of the <i>Protection of the</i> <i>Environment Operations Act 1997</i> (POEO Act) Demonstrating compliance with the conditions of an environment protection licence under Schedule 1 of the POEO Act Tracking hazardous waste within NSW and interstate in accordance with <i>Movement of Controlled Waste NEPM</i> Reporting against NSW <i>Waste Avoidance and Resource Recovery</i> (<i>WARR</i>) Strategy performance indicators in 4 key result areas <i>WARR Act</i> requirements for Extended Producer Responsibility Priority Statements Requirements of the NEPM for used packaging materials Key waste data published for legislative requirements : Two-yearly (approx.) report on progress of NSW <i>Waste Avoidance</i> & <i>Resource Recovery Strategy</i>, reported in four key result areas: Resource Recovery Waste Prevention & Avoidance Toxicity Litter & illegal dumping Extended Producer Responsibility Priority Statements (as required)

³⁶ The Regulated Area in NSW includes Sydney Metropolitan area (SMA), the Extended Regulated area (ERA) which includes the Hunter and Illawarra regions, and the Regional Regulated Area (RRA) which includes 19 Local Government areas north of Port Stephens up to the Queensland border, and Blue Mountains and Wollondilly.

Jurisdiction	Government Body	Key jurisdiction-wide waste data collection pathways, requiring the implementation of classification systems	Primary purposes / end-uses of the information
Victoria	Environment Protection Authority (EPA)	 Landfill Levy – Quarterly & Annual Landfill Returns Transport certification data on Prescribed Industrial Waste - Monthly PIW returns Annual volumetric estimates for some waste facilities 	 Primary reasons: Payment of the landfill levy Variable landfill levies for municipal and different hazard categories of industrial waste Volumetric assessments are part of the licence conditions for some facilities Tracking hazardous wastes within Victoria and interstate in accordance with Movement of Controlled Waste NEPM EPA Victoria mainly uses data internally but transfers all data to Sustainability Victoria for inclusion in other reports.
	Sustainability Victoria (Sus. Vic)	 Sustainability Victoria collects: Local Government Data Collection survey (LGDC) State Environment Protection Policy for Used Packaging Materials survey (SEPP) Annual Survey of Recycling Industries Annual Litter Survey 	 Primary reasons: Legislative requirements and progress for the Towards Zero Waste Strategy Requirements of the NEPM for used packaging materials Recycling industry survey has consistent structure and monitors trends over long time periods (currently data exists for 8 years) Litter survey is consistent with Keep Australia Beautiful annual litter reporting The following key waste reports are published: Local Government Annual Survey Report Annual Survey of Recycling industries Report Annual Litter Survey

Jurisdiction	Government Body	Key jurisdiction-wide waste data collection pathways, requiring the implementation of classification systems	Primary purposes / end-uses of the information
Queensland	Department of Environment and Resource Management (DERM)	 Current data collection in (2011 financial year): Annual Reporting for licensed Landfill facilities in non- levied zones Annual Local Government Survey Annual Reporting by licensed recyclers & reprocessors Hazardous waste movements Additional future data collection from FY 2012: Monthly Landfill Reporting for licensed Landfill facilities in Levy Zone (from 1 Dec 2011) New reporting requirements for other waste handlers/facilities (local governments and recyclers) expected to be introduced according to legislative requirements	 Primary reasons: Payment of landfill levy (to be introduced 1 December 2011 in specifies zones of the state, applicable only to commercial waste) Requirements of the NEPM for used packaging materials Tracking hazardous waste in accordance with Movement of Controlled Waste NEPM Requirements of the NEPM for used packaging materials Key state-wide reporting published is: Annual Waste and Recycling Report card

Jurisdiction	Government Body	Key jurisdiction-wide waste data collection pathways, requiring the implementation of classification systems	Primary purposes / end-uses of the information
South Australia	Environment Protection Authority (EPA)	 Current data collection: Annual survey for waste depots (>10,000 tonnes p.a.) Waste Levy Audits of Landfills Hazardous waste movements The EPA and Zerowaste SA are currently working to jointly develop a new reporting system for landfill facilities, with five key waste streams identified. 	 Primary reasons: In terms of the levy application, the only distinction is between Clean Fill – which does not attract the levy – and other waste, which does attract the levy. Therefore, landfills are only required to report total tonnages in these two streams Some landfill facilities are small in size and capacity, have no weighbridge, and/or are sometimes un-manned, and accordingly data collection capability is limited Tracking hazardous waste in accordance with Movement of Controlled Waste NEPM
	Zerowaste SA	 Local Government Kerbside Performance Surveys (with or without domestic waste audit data) Annual Recycling Industry Survey Household Hazardous Waste and Farm Chemical collection program data Zerowaste Environmental User System (ZEUS) 	 Primary reasons: Kerbside performance reports are mandatory for LGAs receiving Performance Grants, but other LGAs submit data voluntarily Requirements of the NEPM for used packaging materials Requirements of SA Container deposit legislation Key reports published: Annual Recycling Activity in SA report Mid-term and Final reviews of SA Waste Strategy
	Office of Local Government	 Annual survey of Local government includes a section for reporting total tonnages of waste collected by the council 	Primary reasons: Annual Local Government survey conducted on wide range of parameters (including waste management services) to benchmark costs and performance of LGA across the state

Jurisdiction	Government Body	Key jurisdiction-wide waste data collection pathways, requiring the implementation of classification systems	Primary purposes / end-uses of the information
Western Australia	Department of Environment and Conservation (DEC)	 Key waste data collection requires: Metropolitan Landfills (only) Report Monthly on Waste Classification and Composition Surveys of Recycling Activity (from all source streams) based on re-processor surveys, industry surveys and export data Ad hoc Landfill/Transfer Station audits undertaken (for C&I, C&D streams) Ad hoc domestic waste audits undertaken by Local Government Movements of hazardous wastes 	 Primary Reasons: Licenced Metro landfills report under <i>Waste Avoidance and</i> <i>Resource Recovery</i> legislation Tracking hazardous waste in accordance with Movement of Controlled Waste NEPM Local Government Survey complies with legislative data requirements, including for NEPMs Most regional landfill facilities are small in size and capacity, have no weighbridge and/or are un-manned so data collection capability is limited Key report published: Annual Report on Recycling Activity
Tasmania		 Limited waste data is collected and currently consists of: Annual landfill performance report from Movements of hazardous waste materials 	 Primary reasons: Compliance with facility license conditions for Level 2 licensed landfills only Tracking hazardous waste in accordance with Movement of Controlled Waste NEPM At present there is limited waste data collection at a state-wide level however a standard classification system exists for all waste reporting which is based on the AWD system, and additional reporting is expected to be introduced in the near future.

Jurisdiction	Government Body	Key jurisdiction-wide waste data collection pathways, requiring the implementation of classification systems	Primary purposes / end-uses of the information
Australian Capital Territory	Territory and Municipal Services (TAMS)	 Weighbridge tonnages (and tonnages estimates according to set guidelines) Domestic Kerbside Audits Landfill Audits Annual Recycling Industry Statistics Survey Other C&D and C&I stream industry interviews Data from certified Controlled Wastes transported 	 Primary reasons: Tracking hazardous waste in accordance with Movement of Controlled Waste NEPM Compliance with Environmental Authorisations Accountability Indicators reporting throughout year Key data published: TAMs Annual Report (legislative requirement)
Northern Territory	Department of Natural Resources, Environment, the Arts and Sport (NREAS)	Licensed landfill annual compliance reports Data from certified Listed Wastes transported by licensed waste handlers & facilities	 Primary reasons: Compliance with landfill license conditions Tracking hazardous waste in accordance with Movement of Controlled Waste NEPM Most regional landfill facilities are small in size and capacity, have no weighbridge and/or are un-manned so data collection capability is limited Territory-wide data is not currently published in a systematic way.

APPENDIX C

LIQUID WASTE ASSESSMENT REPORT (HYDER, 2012) APPENDIX 2

The table below has been reproduced from the *Liquid Waste Assessment Report* (Hyder, 2012) (with modifications by Hyder to the WA column to reflect an April 2012 update). The table compares the waste classifications and codes that are tracked within each jurisdiction's internal waste tracking system against the list of 73 NEPM waste categories (under 15 over-arching categories). It demonstrates that, despite a national approach to tracking hazardous wastes under the *Controlled Waste NEPM*, inconsistencies still exist between the classifications adopted by jurisdictions (and the associated codes). This can cause management issues for those involved in cross-border transport of hazardous waste. [Note: The 73 categories as referred to in Table 8-10 were updated in 2010. Currently, there are 75 categories, with the addition of 'Reactive chemicals', 'Reducing agents' and 'Oxidising agents' and the omission of 'Sewage sludge and residues including nightsoil and septic tank sludge'. Some other minor wording changes were also made.

Table 8-10 From, Liquid Waste Assessment Report (Hyder, 2012)

Appendix 2- Analysis of States hazardous waste tracking systems against the categories of the National Environment Protection (Movement of Controlled Wastes Between States and Territories) Measure

COLOR LEGEND:	Waste not tracked for internal movements
	Additional waste code to NEPM full list
	Difference in waste code or definition.

NEPM 15 reporting categories	Full List of NEPM waste requiring reporting	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
		NA	code	description	NA	code	description	code	description	NA	code	description	description (codes don't align to NEPM so not included)
A Plating & heat treatment	Waste resulting from surface treatment of metals and plastics		A100	Waste resulting from surface treatment of metals and plastics		A100	Waste from surface treatment of metals and plastics	A100	Waste resulting from surface treatment of metals and plastics		A100	Cyanide- containing wastes.	Waste resulting from surface treatment of metals and plastics
	Waste from heat treatment and tempering operations containing cyanides		A110	Waste from heat treatment and tempering operations containing cyanides		A110	Waste from heat treatment and tempering operations that use cyanides	A110	Waste from heat treatment and tempering operations containing cyanides				
	Cyanides (inorganic)		A130	Cyanides (inorganic)		A130	Cyanides (inorganic)	A130	Cyanides (inorganic)				Cyanides (inorganic)
B Acids	Acidic solutions or acids in solid form		B100	Acidic solutions or acids in solid form		B100	Acidic solutions or acids in solid form	B100	Acidic solutions or acids in solid form		B100	Acids in a solid form or acidic solutions with pH value of 4 or less.	Acidic solutions or acids in solid form

NEPM 15	Full List of NEPM	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
reporting	waste requiring												
categories	reporting												
C Alkalis	Basic solutions or		C100	Basic solutions or		C100	Basic (alkaline)	C100	Basic solutions or		C100	Alkaline solids or	Basic
	bases in solid			bases in solid			solutions or		bases in solid			alkaline solutions	solutions or
	form			form			bases (alkalis) in		form			with pH value of 9	bases in
	101111			101111			solid form		lonn			or more	solid form
Dinorganic	Metal carbonyls		D100	Metal carbonyls		D100	Metal carbonyls	D100	Metal carbonyls		D100	Metal carbonyls	Metal
chemicals	Metal carbonyis		DIOU	wictar carbonyis		Dioo	Wetar carbonyis	DIOO	Wietar carborryis		DIOU	wietar carborryis.	carbonyls
chefinears	Inorganic fluorino		D110	Inorganic fluoring		D110	Inorganic fluoring	D110	Inorganic fluoring		D110	Inorganic fluoring	Inorgania
			DIIO			DIIO	norganic nuonne	DIIO			DIIO		fluorino
	compounds			compounds			then coloium					(avaluding coloium	
	excluding calcium						fluorido		excluding calcium				compounds
	nuonae			nuonde			nuonde		nuonae			nuonde).	excluding
													Calcium
			D 400	Management		D400	N4	D 400	M		D400	Manageral	fluoride
	Mercury, mercury		D120	Mercury, mercury		D120	Mercury, mercury	D120	Mercury, mercury		D120	Mercury and	Mercury,
	compounds			compounds			compounds		compounds			mercury	mercury
												compounds.	compounds
	Arsenic, arsenic		D130	Arsenic, arsenic		D130	Arsenic, arsenic	D130	Arsenic, arsenic		D130	Arsenic and	Arsenic or
	compounds			compounds			compounds		compounds			arsenic	arsenic
												compounds.	compounds
	Chromium		D140	Chromium		D140	Chromium	D140	Chromium		D140	Chromium	Chromium
	compounds			compounds			compounds		compounds			compounds	compounds
	(hexavalent and			(hexavalent and			(hexavalent and		(hexavalent and			(hexavalent and	(hexavalent
	trivalent)			trivalent)			trivalent)		trivalent)			trivalent).	and trivalent)
	Cadmium,		D150	Cadmium,		D150	Cadmium,	D150	Cadmium,		D150	Cadmium and	Cadmium or
	cadmium			cadmium			cadmium		cadmium			cadmium	cadmium
	compounds			compounds			compounds		compounds			compounds.	compound
	Beryllium,		D160	Beryllium,		D160	Beryllium,	D160	Beryllium,		D160	Beryllium and	Beryllium,
	beryllium			beryllium			beryllium		beryllium			beryllium	beryllium
	compounds			compounds			compounds		compounds			compounds.	compounds
	Antimony.		D170	Antimony.		D170	Antimony.	D170	Antimony.		D170	Antimonv and	Antimony or
	antimony		-	antimony		_	antimony	_	antimony		-	antimony	antimony
	compounds			compounds			compounds		compounds			compounds.	compound
	Thallium, thallium		D180	Thallium thallium		D180	Thallium thallium	D180	Thallium, thallium		D180	Thallium and	Thallium and
	compounds			compounds			compounds		compounds			thallium	thallium
				competinde			compoundo		oompoundo			compounds.	compounds.
	Copper		D190	Copper		D190	Copper	D190	Copper		D190	Copper	Copper
	compounds		Dicc	compounds		2100	compounds	5100	compounds		Dioo	compounds	compounds
	Cobalt		D200	Cobalt			compoundo	D200	Cobalt		D200	Cobalt and cobalt	Cobalt and
	compounds		0200	compounds				0200	compounds		D200	compounds	cobalt
	compounds			compounds					compounds			compounds.	compounde
	Nickel	<u> </u>	D210	Nickel		D210	Nickel	D210	Nickel		D210	Nickel	Nickol
	compounds		0210	compounds		0210	compounds	0210	compounds		0210	compounds	compounds
			D220			D220		D220			D220		
1	Leau, leau		0220	Leau, leau		0220		0220			D220		Leau, leau
	Zine compounds		Dooc			Dooc		Dooc			Dooc		
	Zinc compounds		D230	∠inc compounds		D230	∠inc compounds	D230	∠inc compounds		D230	∠inc compounds.	∠inc
1	1		1	1	<u> </u>	1	1	I			<u> </u>	1	compounds

NEPM 15	Full List of NEPM	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
reporting	waste requiring												
Categories	Selenium, selenium compounds		D240	Selenium, selenium compounds		D240	Selenium, selenium compounds	D240	Selenium, selenium compounds		D240	Selenium and selenium compounds.	Selenium and selenium compounds
	Tellurium, tellurium compounds		D250	Tellurium, tellurium compounds		D250	Tellurium, tellurium compounds	D250	Tellurium, tellurium compounds				Tellurium, tellurium compounds
	Vanadium compounds		D270	Vanadium compounds		D270	Vanadium compounds	D270	Vanadium compounds				Vanadium compounds
	Barium compounds (excluding barium sulphate)		D290	Barium compounds (excluding barium sulphate)		D290	Barium compounds (excluding barium sulphate)	D290	Barium compounds (excluding barium sulphate)		D290	Barium compounds.	Barium compounds (excluding barium sulphate)
	Non toxic salts		D300	Non toxic salts		D300	Non-toxic salts	D300	Non toxic salts		D300	Non-toxic salts (e.g. sodium chloride, calcium chloride).	Non toxic salts
	Boron compounds		D310	Boron compounds		D310	Boron compounds	D310	Boron compounds		D310	Boron compounds.	Boron compounds
	Inorganic sulfides		D330	Inorganic sulfides		D330	Inorganic sulphides	D330	Inorganic sulfides		D330	Inorganic sulfur- containing compounds.	Inorganic sulfides
	Perchlorates		D340	Perchlorates		D340	Perchlorates	D340	Perchlorates				Perchlorates
	Chlorates		D350	Chlorates		D350	Chlorates	D350	Chlorates				Chlorates
	Phosphorus compounds excluding mineral phosphates		D360	Phosphorus compounds excluding mineral phosphates		D360	Phosphorus compounds other than mineral phosphates	D360	Phosphorus compounds excluding mineral phosphates		D360	Phosphorus compounds, excluding mineral phosphates.	Phosphorus compounds excluding mineral phosphates
											D390	Inorganic chemicals, NOS.	
											D400	Smelter waste containing prescribed waste.	
											D261	Waste from the production, formulation and use of photographic chemicals and processing materials (containing silver)	

NEPM 15 reporting categories	Full List of NEPM waste requiring reporting	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
Gategorice	roporting										D141	Tannery wastes containing chromium.	
											D121	Equipment and articles containing mercury.	
E Reactive chemicals	Waste containing peroxides other than hydrogen peroxide		E100	Waste containing peroxides excl hydrogen peroxide		E100	Waste containing peroxides other than hydrogen peroxide	E100	Waste containing peroxides other than hydrogen peroxide		E100	Oxidising agents, including peroxides, NOS.	Waste containing peroxides other than hydrogen peroxide
	Waste of an explosive nature not subject to other legislation		T200	Waste of an explosive nature not subject to other legislation		E120	Waste of an explosive nature other than an explosive within the meaning of the Explosives Act 1999	E120	Waste of an explosive nature not subject to other legislation		E120	Waste of an explosive nature not subject to other legislation, including azides.	Waste of an explosive nature not subject to other legislation
											E130	Highly reactive chemicals, NOS.	
F Paints, resins, inks, organic sludges	Waste from the production, formulation and use of inks, dyes, pigments, paints, lacquers and varnish		F100	Waste from the production, formulation and use of inks, dyes, pigments, paints, lacquers and varnish		F100	Waste from the production, formulation and use of inks, dyes, pigments, paints, lacquers & varnish	F100	Waste from the production, formulation and use of inks, dyes, pigments, paints, lacquers and varnish		F100	Aqueous-based wastes from the production, formulation and use of inks, dyes, pigments, paints, lacquers and varnish.	Waste from the production, formulation and use of inks, dyes, pigments, paints, lacquers and varnish
	Waste from the production, formulation and use of resins, latex, plasticisers, glues and adhesives		F110	Waste from the production, formulation and use of resins, latex, plasticisers, glues and adhesives		F110	Waste from the production, formulation and use of resins, latex, plasticisers, glues and adhesives	F110	Waste from the production, formulation and use of resins, latex, plasticisers, glues and adhesives		F110	Aqueous-based wastes from the production, formulation and use of resins, latex, plasticisers, glues and adhesives.	Waste from the production, formulation and use of resins, latex, plasticisers, glues and adhesives

NEPM 15	Full List of NEPM	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
reporting categories	waste requiring reporting												
											F120	Solvent-based wastes from the production, formulation and use of inks, dyes, pigments, paints, lacquers and varnish.	
											F130	Solvent-based wastes from the production, formulation and use of resins, latex, plasticisers, glues and adhesives.	
G Organic solvents	Ethers		G100	Ethers		G100	Ethers	G100	Ethers		G100	Ethers and highly flammable hydrocarbons, such as petrol and jet fuel.	Ethers
	Organic solvents excluding halogenated solvents		G110	Organic solvents excluding halogenated solvents		G110	Organic solvents other than halogenated solvents	G110	Organic solvents excluding halogenated solvents		G110	Non-halogenated organic solvents.	Organic solvents excluding halogenated solvents
	Halogenated organic solvents		G150	Halogenated organic solvents		G150	Halogenated organic solvents	G150	Halogenated organic solvents		G150	Halogenated organic solvents.	Halogenated organic solvents
	Waste from the production, formulation and use of organic solvents		G160	Waste from the production, formulation and use of organic solvents		G160	Waste from the production, formulation and use of organic solvents	G160	Waste from the production, formulation and use of organic solvents		G160	Wastes from the production, formulation and use of organic solvents, NOS.	Waste from the production, formulation and use of organic solvents
											G130	Dry-cleaning wastes containing organic solvents, such as perchloroethylene.	

NEPM 15	Full List of NEPM	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
reporting	waste requiring												
categories	reporting		114.00			114.00	Manta francista	114.00	Manta francista		114.00		Destiside
H Pesticides	waste from the		H100	vvaste from the		H100	vvaste from the	H100	vvaste from the		H100	waste from the	Pesticide
	formulation and			formulation and			formulation and		formulation and			formulation and	Concentrate
	use of biocides			use of biocides			use of biocides		use of biocides			use of biocides	3
	and			and			and		and			and	
	phytopharmaceuti			phytopharmaceuti			phytopharmaceuti		phytopharmaceuti			phytopharmaceuti	
	cals			cals			cals		cals			cals, NOS.	
	Organic		H110	Organic		H110	Organic	H110	Organic		H110	Organophosphoru	Organochlori
	phosphorus			phosphorous			phosphorous		phosphorous			s pesticides.	ne pesticides
	compounds			compounds			compounds		compounds				
	Waste from the		H170	Waste from		H170	Waste from	H170	Waste from		H170	Copper-chrome-	Waste from
	manufacture,			manufacture,			manufacture,		manufacture,			arsenic (CCA).	the
	formulation and			formulation and			formulation and		formulation and				manufacture,
	use of wood-			use of wood-			use of wood-		use of wood-				formulation
	preserving			preserving			preserving		preserving				and use of
	chemicais			chemicais			chemicais		Chemicais				preserving
													chemicals
											H160	Mixed pesticide	chichicale
												residue.	
J Oils	Waste mineral		J100	Waste mineral		J100	Mineral oils	J100	Waste mineral		J100	Waste oils unfit	Waste
	oils unfit for their			oils unfit for their					oils unfit for their			for their original	mineral oils
	original intended			original intended					original intended			intended use	unfit for their
	use			use (NOTE: NSW					use			(lubricating,	original
				exemption with								nyuraulic).	intended use
				oils are being									
				sent for recycling)									
	Waste oil/water,		J120	Waste oil/water,		J120	Oil and water	J120	Waste oil/water,		J120	Waste oils and	
	hydrocarbons/wat			hydrocarbons/wat			mixtures or		hydrocarbons/wat			water mixtures or	
	er mixtures or			er mixtures or			emulsions, or		er mixtures or			emulsions, and	
	emulsions			emulsions			hydrocarbons and		emulsions			hydrocarbon and	
							water mixtures or					water mixtures or	
	Masta tanını		14.00			14.00	emulsions	14.00			14.00	emulsions.	
	waste tarry		J160	vvaste tarry		J160	arising from	J160	vvaste tarry		J160	arry residues	vvaste tarry
	from rofining			from refining			ansing nom		from rofining			rofining distillation	arising from
	distillation, and			distillation and			distillation and		distillation and			and any pyrolytic	refining
	any pyrolytic			any pyrolytic			any pyrolytic		any pyrolytic			treatment.	distillation or
	treatment			treatment			treatment		treatment				pyrolytic
													treatment
								1			J110	Waste	
												hydrocarbons.	

NEPM 15 reporting	Full List of NEPM waste requiring	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
Calegones											J130	Triple interceptor waste and stormwater	
												contaminated with oil or	
											J140	Transformer fluids	
		+	<u> </u>	1		<u> </u>		<u></u> ∣			J150	Other (cutting oils,	
	+				<u> </u>		<u> </u>				J170	Used oil filters.	
K Putrescible/org anic waste	Animal effluent and residues (abattoir effluent, poultry and fish processing waste)		K100	Animal effluent and residues (abattoir effluent, poultry and fish processing wastes)		K100	Animal effluent and residues (abattoir effluent, poultry and fish processing wastes)	K100	Animal effluent and residues (abattoir effluent, poultry and fish processing wastes)		K100	Animal effluent and residues.	Animal effluent and residues (abattoir effluent, poultry and fish processing wastes)
	Grease trap waste		K110	Grease trap waste		K110	Grease trap waste	K110	Grease trap waste		K120	Grease interceptor trap effluent.	Waste from Greasetraps
	Sewage sludge and residues including nightsoil and septic tank sludge		K130	Sewage sludge and residues including nightsoil and septic tank sludge		K130	Sewage sludge and residues including nightsoil and septic tank sludge	K130	Sewage sludge and residues including nightsoil and septic tank sludge				Sewage
	Tannery wastes (including leather dust, ash, sludges and flours)		K140	Tannery wastes including leather dust, ash, sludges and flours		K140	Tannery wastes (including leather dust, ash, sludges and flours)	K140	Tannery wastes (including leather dust, ash, sludges and flours)		K140	Tannery wastes (not containing chromium) and wool scouring wastes.	Tannery wastes (including leather dust, ash, sludges and flours)
	Wool scouring waste		K190	Wool scouring wastes		K190	Wool scouring wastes	K190	Wool scouring wastes		K140	Tannery wastes (not containing chromium) and wool scouring wastes.	Wool scouring wastes
						K200	Liquid food processing waste				K200	Food and beverage processing wastes, including animal and vegetable oils and derivatives.	

NEPM 15 reporting categories	Full List of NEPM waste requiring reporting	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
													Vegetable and food processing waste
L Industrial washwater	Note: No NEPM waste types refer to L category										L100	Car and truck wash waters.	
											L150	Industrial wash waters from cleaning, rinsing or washing operations, NOS.	
M Organic chemicals	Waste, substances and articles containing or contaminated with polychlorinated biphenyls (PCBs), polychlorinated naphthalenes (PCNs), polychlorinated terphenyls (PCTs) and/or polybrominated biphenyls (PBBs)		M100	Waste substances and articles containing or contaminated with polychlorinated biphenyls, polychlorinated napthalenes, polychlorinated terphenyls and/or polybrominated biphenyls		M100	Material containing polychlorinated biphenyls (PCBs), polychlorinated napthalenes (PCNs), polychlorinated terphenyls (PCTs) and/or polybrominated biphenyls (PBBs)	M100	Waste substances and articles containing or contaminated with polychlorinated biphenyls [(PCBs), polychlorinated napthalenes (PCNs), polychlorinated terphenyls (PCTs) and/or polybrominated biphenyls (PBBs)]		M100	Polychlorinated biphenyls (PCBs) (PCBs >50 mg per kg).	Waste substances and articles containing or contaminate d with polychlorinat ed biphenyls [(PCBs), polychlorinat ed napthalenes (PCNs), polychlorinat ed terphenyls (PCTs) and/or polybrominat ed biphenyls (PBBs)]
											M110 M120	Waste substances and articles containing or contaminated with polychlorinated biphenyls (PCBs) ([PCBs] >50 mg per kg). Solvents, oils and materials contaminated with	

NEPM 15 reporting	Full List of NEPM waste requiring	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
categories	reporting Phenols, phenol compounds including chlorophenols		M150	Phenols, phenol compounds including chlorophenols		M150	Phenols, phenol compounds including chlorophenols	M150	Phenols, phenol compounds including chlorophenols		M150	Phenol and phenol compounds, including halogenated	Phenols, phenol compounds including chlorophenol
	Organohalogen compounds - other than substances referred to in this list		M160	Organo halogen compounds— other than substances referred to in this Table or Table 2		M160	Organohalogen compounds — other than another substance referred to in this table	M160	Organohalogen compounds – other than substances referred to in this list		M160	Halogenated organic chemicals, NOS.	S Organohalog en compounds — other than another substance referred to in this table
	Polychlorinated dibenzo-furan (any congener)		M170	Polychlorinated dibenzo-furan (any congener)		M170	Polychlorinated dibenzo-furan (any congener)	M170	Polychlorinated dibenzo-furan (any congener)				Polychlorinat ed dibenzo- furan (any congener)
	Polychlorinated dibenzo-p-dioxin (any congener)		M180	Polychlorinated dibenzo-p-dioxin (any congener)		M180	Polychlorinated dibenzo-p-dioxin (any congener)	M180	Polychlorinated dibenzo-p-dioxin (any congener)				Polychlorinat ed dibenzo- p-dioxin (any congener)
	Cyanides (organic)		M210	Cyanides (organic)		M210	Cyanides (organic)	M210	Cyanides (organic)				Organic Cyanide
	Isocyanate compounds		M220	Isocyanate compounds		M220	Isocyanate compounds	M220	Isocyanate compounds		M220	Isocyanate compounds (organic).	Isocyanate compounds
	Triethylamine catalysts for setting foundry sands		M230	Triethylamine catalysts for setting foundry sands		M230	Triethylamine catalysts for setting foundry sands	M230	Triethylamine catalysts for setting foundry sands		M230	Amines and other nitrogen compounds.	Triethylamin e catalysts for setting foundry sands
	Surface active agents (surfactants), containing principally organic constituents and which may contain metals and inorganic materials		M250	Surface active agents (surfactants), containing principally organic constituents and which may contain metals and inorganic materials		M250	Surface active agents (surfactants), containing principally organic constituents and which may contain metals and inorganic materials	M250	Surface active agents (surfactants), containing principally organic constituents and which may contain metals and inorganic materials		M250	Detergents and surface active agents (surfactants).	Surface active agents (surfactants), containing principally organic constituents and which may contain metals and inorganic materials

NEPM 15	Full List of NEPM	ACT	I	NSW	NT		QLD		SA	TAS		VIC	WA
reporting categories	waste requiring												
outegonico	Highly odorous		M260	Highly odorous		M260	Highly odorous	M260	Highly odorous		M260	Highly odorous	Highly
	organic chemicals			organic chemicals			organic chemicals		organic chemicals			organic chemicals	odorous
	(including			(including			(including		(including			(including	organic
	mercaptans and			mercaptans and			mercaptans and		mercaptans and			mercaptans and	chemicals
	acrylates)			acrylates)			acrylates)		acrylates)			acrylates).	(including
													mercaptans
													and
													acrylates).
											M130	Non-halogenated	
												organic chemicals	
												(non solvent),	
												NUS. Examples:	
												giycol coolant,	
												brake fluid	
N Soil/sludge	Containers which		N100	Containers and				N100	Containers and		N100	Prescribed waste	Containers
j	are contaminated			drums that are					drums which are			residues in rigid	and drums
	with residues of			contaminated					contaminated			steel or plastic	which are
	substances			with residues of					with residues of			containers with an	contaminate
	referred to in this			substances					substances			original volume	d with
	list			referred to in this					referred to in this			less than 200	residues of
				list					list			litres (hazardous	substances
												substances to be	referred to in
			NIGOO			NIGOO		NIGOO			NIGOO	specified).	this list
	Aspestos		N220	ASDESTOS		N220	Aspestos	N220	Aspestos		N220	Aspestos.	Aspestos
	Solis		N120	Solis				N120	Solis				Solis
	with a controlled			with a substance					with a controlled				d with a
	waste			or waste referred					waste				controlled
	Wubic			to in this Table					Wabio				waste
	Fire debris and		N140	Fire debris and		N140*	Fire debris and	N140	Fire debris and		N140	Fire debris and	Fire debris
	fire wash waters			fire wash waters			fire wash waters		fire wash waters			fire wash-waters	and
												that are	washwater
												contaminated with	(may
												chemicals (must	
												specify	
	Else est.		NI450	E ho anh		NIAEO	E h a sah	NI4 50	E hu anti		NIAEO	contaminants).	E ho an h
	Fly ash		N150	Fly ash		N150	Fly ash	N150	Fly ash		N150	Fly ash.	Fly ash
	chemically-fixed		10100	chemically fixed			chemically fixed	00171	chemically fixed		N170	industrial wastee	
	solidified or			solidified or			chemically-lixed,		solidified or			that are	u, chemically-
	nolymerised			polymerised			polymerised		polymerised			chemically fixed	fixed
	wastes			wastes			wastes		wastes			and/or	solidified or
				maoroo			1140100					encapsulated.	polymerised
													wastes
	Filter cake		N190	Filter cake		N190	Filter cake	N190	Filter cake		N190	Filter cake.	Filter cake

NEPM 15	Full List of NEPM	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
reporting	waste requiring												
	Residues from industrial waste treatment/disposa I operations.		N205	Residues from industrial waste treatment/disposa I operations		N205	Residues from industrial waste treatment/disposa l operations	N205	Residues from industrial waste treatment/disposa I operations		N210	Residues from pollution control operations, NOS.	Residues from industrial waste treatment/dis posal operations
	Ceramic-based fibres with physico-chemical characteristics similar to those of asbestos		N230	Ceramic-based fibres with physico-chemical characteristics similar to those of asbestos				N230	Ceramic-based fibres with physico-chemical characteristics similar to those of asbestos		N230	Ceramic-based fibres with physico-chemical characteristics similar to those of asbestos.	Ceramic- based fibres with physico- chemical characteristi cs similar to those of asbestos
											N105	Prescribed waste residues in rigid steel or plastic containers with an original volume greater than or equal to 200 litres (hazardous substances to be specified).	
											N110 N119	Prescribed waste residues in bags or containers not specified under N100 and N105 (hazardous substances to be specified). Category A	
												contaminated soil	
											N120	Category B contaminated soil	
											N121	Category C contaminated soil	
											N130	Spent catalysts (must specify contaminants).	

NEPM 15 reporting	Full List of NEPM waste requiring	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
categories	reporting						-						
											N160	Prescribed	
												industrial wastes	
												that are	
												classification	
												issued by FPA	
											N180	Prescribed	
												industrial waste	
												that are solidified	
												or polymerised.	
											N200	Ion-exchange	
												column residues.	
											N250	Absorbents	
												contaminated with	
												prescribed waste	
												residues, such as	
												with oils	
												hydrocarbons and	
												organic solvents	
												(must specify	
												contaminants).	
											N260	Solid wastes	
												contaminated with	
												prescribed waste	
												residues, NOS	
												(must specify	
D. Olivia al A			D 400	Oliai salasad		Diant	Olisiaalaad	D 400	Olisiaalaad		D400	contaminants).	Olisiaal
R Clinical &	Clinical and		R100	Clinical and		R100^	Clinical and	R100	Clinical and		R100	Clinical and	Clinical
pharmaceutical	related wastes			related wastes			related wastes		related wastes			related wastes,	vvaste
	Waste		R120	Waste		R120*	Pharmaceuticals	R120	Waste	1	R120	Waste from the	Waste
	pharmaceuticals.		11120	pharmaceuticals.		11120	drugs and	11120	pharmaceuticals.		11120	use of	pharmaceuti
	drugs and			drugs and			medicines		drugs and			pharmaceutical	cals, drugs
	medicines			medicines					medicines			products, NOS.	and
													medicines
	Waste from the		R140	Waste from the		R140	Waste from the	R140	Waste from the		R140	Waste from the	Waste from
	production and			production and			production and		production and			production of	the
	preparation of			preparation of			preparation of		preparation of			pharmaceutical	production
	pnarmaceutical			pnarmaceutical			pnarmaceutical		pnarmaceutical			products and	and
	products			products			products		products			cosmetics, NOS.	preparation of
													pharmaceuti
													cal products

NEPM 15 reporting categories	Full List of NEPM waste requiring reporting	ACT		NSW	NT		QLD		SA	TAS		VIC	WA
			R150	Quarantine Waste (Additional waste code)							R110	Pathogenic substances and quarantine wastes.	
											R130	Cytotoxic substances.	
T Misc	Waste chemical substances arising from research and development or teaching activities including those which are not identified and/or are new and whose effects on human health and/or the environment are not known		T100	Waste chemical substances arising from research and development or teaching activities, including those which are not identified and/or are new and whose effects on human health and/or the environment are not known		T100	Chemical waste arising from a research and development or teaching activity, including new or unidentified material and material whose effects on human health or the environment are not known	T100	Waste chemical substances arising from research and development or teaching activities including those which are not identified and/or are new and whose effects on human health and/or the environment are not known		T100	Waste chemical substances arising from laboratories, research and development, or teaching activities.	Waste chemical substances arising from research and development or teaching activities, including those which are not identified and/or are new and whose effects on human health and/or the environment are not known
	Waste from the production, formulation and use of photographic chemicals and processing materials		T120	Waste from the production, formulation and use of photographic chemicals and processing materials		T120	Waste from the production, formulation and use of photographic chemicals and processing materials	T120	Waste from the production, formulation and use of photographic chemicals and processing materials		T120	Waste from the production, formulation and use of photographic chemicals and processing materials (which do not contain silver).	Waste from the production, formulation and use of photographic chemicals and processing materials
	Tyres		T140	Tyres (not reported for internal movements)		T140	Tyres	T140	Tyres		T 160	Foundry sands	Tyres

NEPM 15	Full List of NEPM	ACT		NSW	NT		QLD	SA	TAS		VIC	WA
categories	reporting											
										T130	Inert sludges or slurries, such as clay or ceramic suspensions, drilling mud, and pit water with negligible hydrocarbon contamination.	
										T170	Waste chemicals in small quantities, NOS, such as collected household chemicals.	
COLOR	Waste not tracked for	r internal m	ovements			-						
LEGEND:	Additional waste code	e to NEPM	full list									
	Difference in waste c	ode or defi	nition.]							

APPENDIX D

REVIEW OF AUSTRALIA'S INTERNATIONAL WASTE-RELATED REPORTING OBLIGATIONS (SKM, DRAFT) TABLE 2

The table below is taken from a draft version of SKM's report, *Review of Australia's International Waste-related Reporting Obligations* (provided to Hyder 5 December 2012) and may be subject to change in the final published version. It demonstrates the type of data that the Commonwealth reports, much of which is originally collected at the local / site level in accordance with jurisdictional classification systems, collated and aggregated by each jurisdiction and then reported to the Commonwealth. Therefore, inconsistencies in classification systems may ultimately impact on the quality and comparability of data reported internationally.

Table 8-11	From, Review of Australia's international waste-related reporting obligations (SKM, draft – subject to review)
	Table 2 - Key content under Australia's main international waste-related reporting obligations, mapped against some individual obligations

Key content	International waste-related reporting obligation									
	Basel Convention	Stockholm Convention	OECD	UNFCC & Kyoto Protocol	Waigani Convention	UN Agenda 21	Global Methane Initiative			
Action taken to minimise the generation of waste	~		~			√				
Disposal/recovery facilities operated, including capacity	~		✓	\checkmark		✓	~			
Total amount of waste generated	√*		✓							
Amount of waste imported / exported	~		✓							
Action taken to minimise the generation of hazardous waste	✓	\checkmark	✓			✓				
Total amount of hazardous waste generated	~	\checkmark	✓							
Total amount of hazardous and other waste generated, by type	~		✓			✓				
Total amount of hazardous waste imported/exported	~	\checkmark	✓		✓					
Amount of hazardous waste and other waste sent to recovery and disposal	~	✓	~	\checkmark						
Municipal waste generated	~		~							
Amount of municipal waste destined for treatment, disposal and recovery	~		~							
Generation of waste by industry sector			~							
Amount of waste generated, recovered, recycled by waste stream (eg C&D) or product (eg WEEE)		✓	~	\checkmark						
Amount of non-hazardous waste going for recycling, composting, incineration or landfill disposal			~							
Split of municipal waste from household and other municipal wastes	~		~							
Waste to landfill, wastewater & waste incineration related emissions of greenhouse gas				\checkmark			~			

APPENDIX E

REVIEW OF AUSTRALIA'S INTERNATIONAL WASTE-RELATED REPORTING OBLIGATIONS (SKM, DRAFT) TABLE 4

The table below is taken from a draft version of SKM's report; *Review of Australia's International Waste-related Reporting Obligations* (provided to Hyder, 5 December 2012) and may be subject to change in the final published version. It provides an assessment of the alignment of existing jurisdictional data and reporting systems to the information that the Commonwealth is obligated to report internationally. Many of these issues relate to the absence of adequate data and reporting systems. However, in some cases, the data and reporting systems exist but the waste classifications on which they are based are inconsistent and misaligned to the required categories, in particular those relating to breakdowns of waste volumes and sources.

Key content required	How do underlying Australian systems compare?
Action taken to minimise the generation of waste	Little to no data.
Disposal/recovery facilities operated, including capacity	Some data in public domain due to waste infrastructure database & map, but still gaps. Little to no facility capacity data available.
Total amount of waste generated	Good capacity to aggregate recovery, recycling & landfill disposal amounts, but scope of data more limited than obligations require. Little to no data on volumes to incineration or disaster wastes. Still some apples-to-oranges differences in state and territory systems regarding scope and coverage (eg non-metro).
Amount of waste imported/exported	Little to no data, except for hazardous waste. Some packaging data includes imports & exports.
Action taken to minimise the generation of hazardous waste	Little to no data.
Total amount of hazardous generated	Some data on hazardous waste moving across borders. Little to no data on hazardous waste within a single jurisdiction. Little data disclosed publically.
Total amount of hazardous and other waste generated, by type	Some data available against hazardous waste types, but lists in Basel, NEPM, NEPM reporting, hazardous tracking systems & other systems do not align. Major gaps in materials type data for non-hazardous waste.
Total amount of hazardous waste imported/exported	Good data.
Amount of hazardous waste and other waste sent to recovery and disposal	Some data in public domain but gaps and consistency issues exist. Energy recovery data and data for some particular wastes (eg organics) poor in completeness and accuracy. Majority of recovery data collected voluntarily.
Municipal waste generated	Good data derived from major collection services contracts. Data quality poorer with transfer stations and smaller councils. Transparency and timeliness issues exist.
Amount of municipal waste destined for treatment, disposal and recovery	Good data derived from major collection services contracts. Data quality poorer with transfer stations and smaller councils. Transparency and timeliness issues exist. Poor fit with energy recovery and 'treatment' aspects of requirements.
Generation of waste by industry sector	Little to no data.
Amount of waste generated, recovered, recycled by waste stream (eg C&D) or product (eg WEEE)	Some jurisdictions have improved arrangements for allocations of waste to stream but still rely on estimation with closed loads. Some jurisdictions have no split between C&I and C&D. Waste data against products or product groups usually poor (eg end of life vehicles).
Amount of non-hazardous waste going for recycling, composting, incineration or landfill disposal	Most recovery and recycling data sets rely on voluntary surveys with results of varying data quality. Landfill tonnages often better than recovery & recycling tonnages. Little to no data on incineration (such as of clinical wastes). Organics data questionable.

Table 8-12	From, Review of Australia's international waste-related reporting obligations (SKM, draft)
	Table 4 - Current data arrangements against key content required by the international obligations

Key content required	How do underlying Australian systems compare?
Split of municipal waste from household	Little to no capacity to split municipal waste data into its component parts.
and other municipal wastes	
Waste to landfill, wastewater & waste	Generally good data, within limitations of emissions estimation methods. Quality problems exist around waste composition data.
incineration related emissions of	
greenhouse gas	
Reporting against collection type	Reasonable data, with some coverage gaps, exists for key household collections (kerbside recycling, kerbside disposal, some green waste) but data quality is poorer for other collection types (such as bulky municipal waste, or C&I collections).
Composition of municipal waste	Some data exists in some jurisdictions for composition of household (if not municipal) waste, mostly derived from kerbside audits. No nationally- consistent materials typology is used, nor is a standard compositional audit method. Composition data at point of landfill disposal is poor.

APPENDIX F

APPENDIX F IS PROVIDED AS A SEPARATE DOCUMENT TO ENABLE PRINTING OF DIAGRAMS IN A3 SIZE