



Government Gazette Staatskoerant

REPUBLIC OF SOUTH AFRICA
REPUBLIEK VAN SUID-AFRIKA

Vol. 549

Pretoria, 30 March
Maart 2011

No. 34167

N.B. The Government Printing Works will not be held responsible for the quality of "Hard Copies" or "Electronic Files" submitted for publication purposes



AIDS HELPLINE: 0800-0123-22 Prevention is the cure

GENERAL NOTICE

DEPARTMENT OF ENVIRONMENTAL AFFAIRS

NOTICE

2011

DRAFT MUNICIPAL WASTE SECTOR PLAN

I, Buyelwa Sonjica, Minister of Water and Environmental Affairs, hereby publish the draft Municipal Waste Sector Plan in the schedule hereto, for public comment.

Interested and affected parties are invited to submit written comments within sixty (60) days of publication of this Notice to The Director-General, Department of Environmental Affairs, Private Bag x447, Pretoria, 0001.

Or

Hand deliver at 2nd floor North Tower, Fedsure Forum Building, 315 Pretorius Street, Pretoria, 0001.

For attention: **Mrs. Khashiwe Masinga**, email: kmasinga@environment.gov.za or fax: (012) 322 5515.

The draft Municipal Waste Sector Plan can be accessed at www.sawic.org.za

Comments received after the closing date may not be considered.

BUYELWA SONJICA
MINISTER OF WATER AND ENVIRONMENTAL AFFAIRS

SCHEDULE

**ADDRESSING CHALLENGES WITH WASTE SERVICE PROVISION IN
SOUTH AFRICA**

DRAFT MUNICIPAL WASTE SECTOR PLAN

JANUARY 2011



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

Executive Summary

This report provides a summary of the current status of waste generation and waste service backlogs at district municipality level. It further provides an overview of the waste sector including the roles and responsibilities of all the different players including the different spheres of government and the private sector. A Vision for the waste sector in line with the National Environmental Management: Waste Act, 2008 is provided including some strategic goals and objectives specifically aimed at addressing the backlogs in waste service delivery. In this regard some interventions and actions required to address the backlog are highlighted. The report further includes indicators and targets for addressing the backlogs and presents an action plan aimed at meeting the overall waste service delivery target, namely, to provide waste collection services to all urban households and dense settlements in South Africa on a sustainable basis.

Glossary

Buy-back Centre	Centre where people sell recyclable material they have collected. Recycling companies buy recyclable materials from buy-back centres and pay only for materials they can use.
Composting Facility	Facility for the aerobic decomposition of biodegradable organic matter to produce compost.
Drop-off Centre	Centre where recyclable materials are dropped off by consumers without receiving payment for the materials.
Landfill Site	Site for the controlled disposal of waste materials.
Materials Recovery Facility	Specialised plant that receive, separate and prepare recyclable materials for marketing to end-user manufacturers and/or recycling companies.
Transfer Station	Facility where waste is temporarily stored, and ideally sorted, before it is transported more economically to either recycling centers or landfills.

TABLE OF CONTENTS

Executive Summary	i
Glossary	ii
1 Introduction	1
1.1 The context	1
1.1.1 Waste generation	1
1.1.2 Waste service backlogs.....	2
1.1.3 Infrastructure backlogs and availability of information	4
1.2 Legal and Institutional framework for the sector	4
1.2.1 The history of the current system	4
1.2.2 Waste institutions	5
1.2.2.1 National Government.....	5
1.2.2.2 Provincial government	6
1.2.2.3 Local Government.....	6
1.2.3 Legal framework	7
1.3 Composition of the sector.....	8
2 Vision and mission for the sector	10
3 Objectives and Priorities for the Municipal Waste Sector.....	11
3.1 Strategic objectives.....	11
3.2 Performance Indicators and Targets	11
3.2.1 Objective 1: Waste Reduction	12
3.2.2 Objective 2: Appropriate disposal	12
3.2.3 Objective 3: Municipal waste service delivery.....	12
3.3 Priority areas for activity	13
3.3.1 Reducing the quantities of waste disposed to landfill	13
3.3.2 Financing and charges for waste services.....	14
3.3.3 Institutional issues	14
3.3.4 Raising the profile of waste management at political level.....	16
3.3.5 Improved data and information	16
3.3.6 Waste separation at source	16
3.3.7 Phasing out of salvaging at landfills.....	17
3.3.8 Suitable land for landfills	17
3.3.9 Optimising waste collection systems.....	17
3.3.9.1 Awareness creation	17
3.3.9.2 Capacity building	18
3.3.9.3 Maintenance	18
3.3.9.4 Holistic planning.....	18
3.3.9.5 Enforcement	19
3.3.10 Poverty eradication.....	19
4 Infrastructure.....	19
4.1 Transfer stations	20
4.2 Materials recovery facilities	20
4.3 Buy-back centres	21
4.4 Drop-off centres	21
4.5 Unit standards for waste service delivery.....	21
5 Human resource requirements.....	22
5.1 Landfill operation	24
6 Action plan	24
6.1 Monitoring and reporting	24
7 References.....	27
Appendix 1 Action Plan for addressing the waste services backlogs.....	31

1 Introduction

In an attempt to fast track service delivery in South Africa, Cabinet directed that all sector departments should account for all service backlogs and based on this information, develop sector plans to address the backlogs. Therefore, the Department of Environmental Affairs as a sector department dealing with waste management, commissioned a study in 2007 which assessed the status of waste service delivery at local government level, including the availability of capacity to deliver this service. Furthermore, the Department of Cooperative Governance and Traditional Affairs set out to determine the root causes of poor performance, distress and dysfunctionality in municipalities and responded to these challenges with the development of the Local Government Turnaround Strategy (COGTA, 2009). Subsequently, government embarked on a performance management system to monitor and evaluate the 12 outcomes that collectively address the main strategic priorities of government (COGTA, 2010). Outcome 9 relating to a responsive, accountable, effective and efficient local government system is of specific relevance.

The Municipal Waste Sector Plan as presented in this report contains government’s strategy to effectively address the backlogs in terms of municipal solid waste service delivery and infrastructure relating to waste management once implemented. The municipal waste sector plan does not only focus on the performance of government but also assesses and accounts for the role of other partners in the waste sector, in ensuring that sustainable service delivery is realised.

1.1 The context

1.1.1 Waste generation

As at 1997, waste generation in South Africa amounted to approximately 533 million tonnes per annum (MT/a) of which the majority comprised mining waste (ca. 88 %) while domestic and trade waste represented 1.5% and sewage sludge 0.1% (DWAF, 2001). These findings are illustrated in Figure 1.

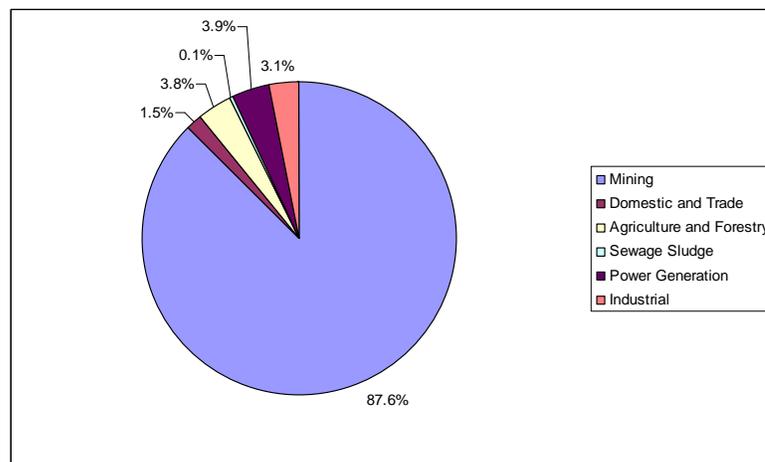


Figure 1: National waste generation rates in South Africa in 1997 (From DWAF, 2001)

The State of the Environment Report (DEAT, 2006) suggests that approximately 15 Mt/a general waste is generated while the research paper towards the development of the National Waste Management Strategy (Prunell, 2009) estimated that general waste (domestic and trade waste) disposed at landfills in 2006/7 amounted to 24.1 million tons/annum. The six

metropolitan municipalities of South Africa (City of Johannesburg, City of Tshwane, City of Cape Town, Nelson Mandela Municipality, Ekurhuleni Municipality and eThekweni Municipality) alone were estimated to dispose of 8.9 million tonnes of municipal solid waste during 2005 (Von Blottnitz *et al.*, 2006).

Municipal waste generation per capita differs noticeably across South African income groups, with low, middle and high income groups generating 0.41, 0.74 and 1.29 kg/capita/day respectively (Fiehn & Ball, 2005). This translates into the middle class, generating in the order of 2.7 Mt/annum of domestic waste (DEAT, 2006) which is comparable to that produced daily in developed countries such as the United Kingdom (Austin *et al.*, 2006).

Waste generation in South Africa is expected to increase, as a result of population and economic growth (DEAT, 1999), at an expected rate of 2-3% per annum (Fiehn & Ball, 2005).

1.1.2 Waste service backlogs

As with other municipal services, severe backlogs still remain in providing universal access to adequate municipal solid waste collection services (DEAT, 2002). Residents of core urban areas have relatively good access to refuse removal services while those in peri-urban and rural areas have limited access to formal services. The General Household Survey of 2007 (Stats SA, 2007) revealed that 39% of households, or 50% of the South African population (Fiehn & Ball, 2005), is not receiving a regular municipal waste collection service, with municipal waste collection having only improved by 2.7% between 1996 and 2001 (Fiehn & Ball, 2005). The status of waste removal services in 2007 is depicted in Figure 2.

The backlog in waste service delivery was confirmed by the assessment of the status of waste service delivery and capacity at local government level (DEAT, 2007). The extent of the waste service backlog as percentage per district municipality is illustrated in Figure 3.

Key findings from the local government capacity assessment (DEAT, 2007) are as follows:

- The waste service function is often not accounted for in small rural towns;
- In rural areas staffing is often skewed towards labourers with few middle and top managers;
- There is a shift towards outsourcing of the recycling function to small community contractors;
- A total of 87% of municipalities do not have the capacity or infrastructure to pursue waste minimisation;
- More than 80% of municipalities are initiating recycling but projects are struggling due to a lack of capacity;
- Metros and secondary municipalities provide the highest percentage of weekly collection services within their areas of jurisdiction; and
- Metros and secondary municipalities have to deal with 54% of the national waste management service backlogs.

Waste service backlogs impact negatively on the quality of life, the environment and human health. "Provision of waste services to all un-serviced areas, especially previously disadvantaged communities, is a priority." (DEAT, 1999: 86).

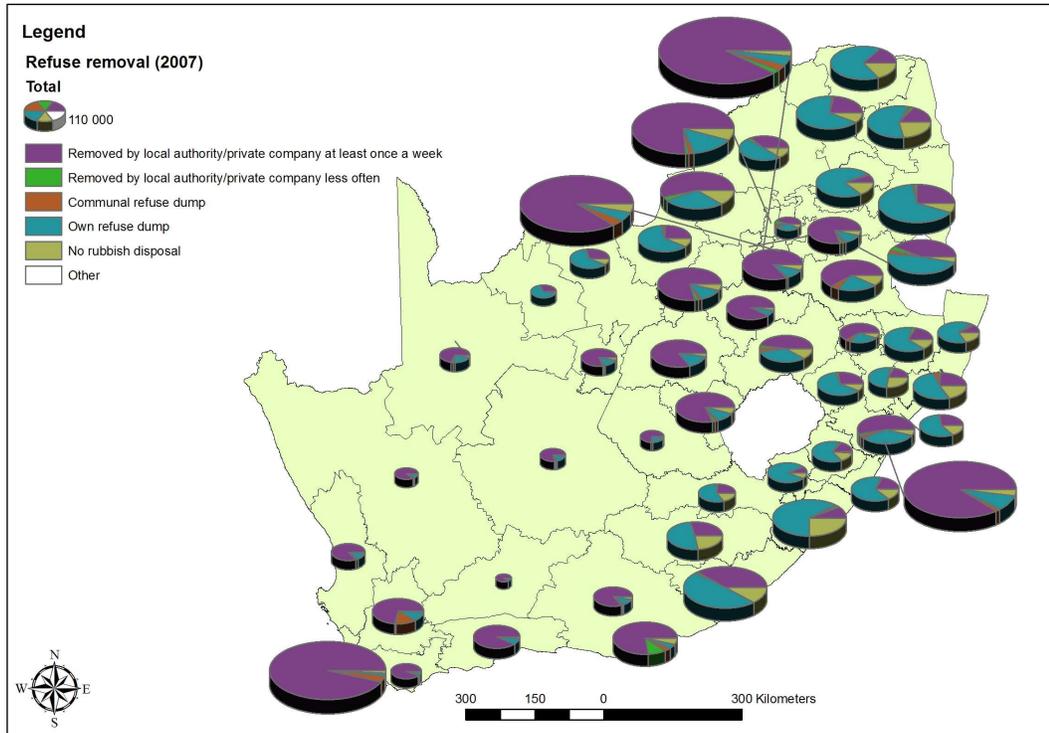


Figure 2 Status of refuse removal per district municipality in 2007

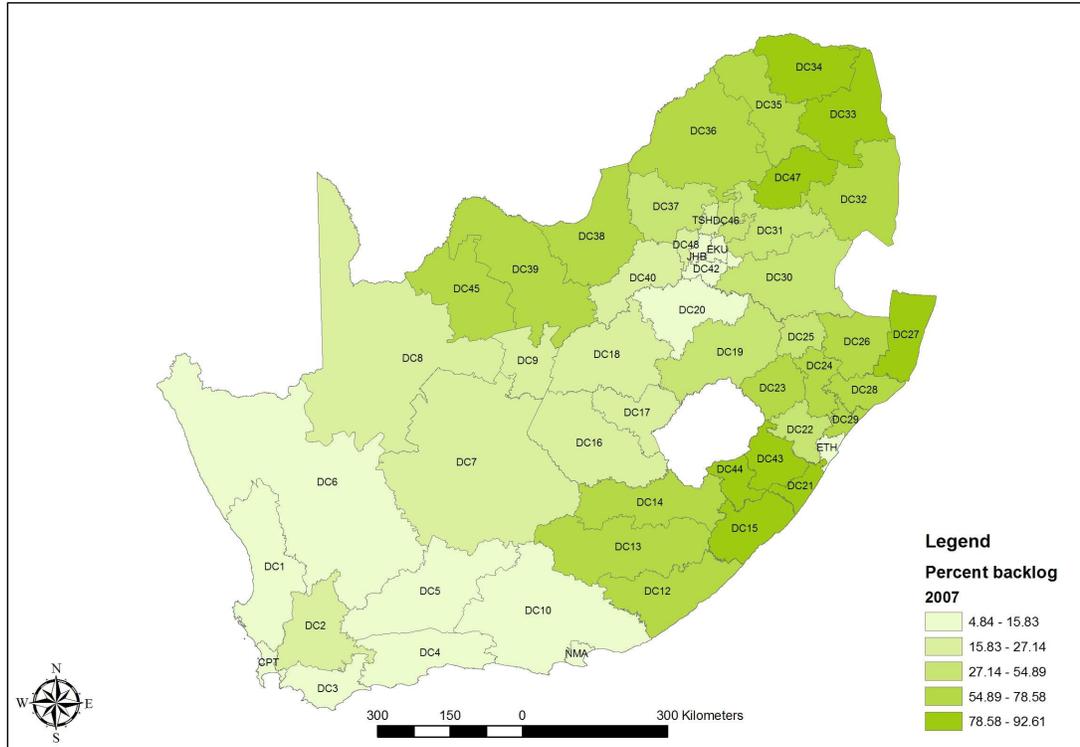


Figure 3 Backlog in services delivery depicted as percentage per district municipality.

1.1.3 Infrastructure backlogs and availability of information

Waste infrastructure includes landfill sites, waste storage facilities, recycling facilities, materials recovery facilities and waste transfer facilities. A 2005 census of available information on these facilities revealed a need for addressing the backlog in the permitting of these sites. A total of 1 336 waste facilities were included in the census (DEAT, 2005). The results of the census data is summarised in Table 1 below.

Table 1 Waste management facilities permit status (DEAT 2005)

Type of facility	Number of facilities	Number of Permitted facilities	% Backlog in permits
General waste Landfill sites	1203	524	56.4%
Hazardous waste landfill sites	77	41	46.8%
Medical waste storage facilities	12	4	66.7%
Recycling facilities	9	2	77.8%
Transfer stations	35	12	65.7%
Total	1336	583	56.4%

The 2007 capacity assessment estimated the number of waste handling facilities to be more than 2 000, of which 530 were licenced (DEAT, 2007). The remaining backlog in facility permits can therefore be calculated as being in the order of 82% of the total.

An additional concern in terms of waste handling facilities is the available capacity of these facilities to deal with the waste volumes. Accurate figures on available national landfill airspace and other general waste handling facilities, including recycling facilities, are not available. It should be noted that addressing the backlog in waste service delivery will lead to an increase in waste entering the formal waste stream, which in turn will result in pressure on the available recycling, treatment and disposal capacity to deal with the waste volumes.

An assessment of available waste treatment and disposal capacity for all waste streams should be considered. The information should be available from the integrated waste management plans (IWMPs) from local municipalities since the development of IWMPs is a legal requirement in terms of the National Environmental Management: Waste Act, 2008 (RSA, 2008: Section 11(4)).

1.2 Legal and Institutional framework for the sector

1.2.1 The history of the current system

The Environment Conservation Act, 1989 (Act No. 73 of 1989) was the first South African law requiring landfill sites to be permitted. The absence of a formal permitting system highlighted the need for standards against which permit applications could be assessed. The first set of minimum requirements for waste disposal to landfill was therefore developed and published in 1994 (Oelofse and Godfrey, 2008a). The minimum requirements for landfills were given legal effect through permit conditions. As such, landfills established before 1994 were not guided by the minimum requirements. In reality, the majority of landfills and dumping sites in South Africa were established prior to 1989. Therefore, permitting of many of these sites require substantial upgrades to meet the minimum requirements which could cause delays in obtaining permits. This may be one factor contributing to the backlog in permitting of landfills.

The institutional framework for government in South Africa was established in 1996 with the adoption of the first democratic Constitution (DPLG, 2007). National, provincial and local government was established as three elected spheres of government, each with distinctive functional responsibilities as outlined in the Constitution of the Republic of South Africa, 1996 (RSA, 1996). The three spheres of government are required to function as a single system of cooperative government for the country as a whole.

The process of decentralisation dramatically changed the roles and responsibilities of local government, in keeping with the transformation that marked all three spheres of government after 1996. The new local sphere of government was created by amalgamating over 800 municipalities into 283 municipalities (DPLG, 2007).

The Constitution (RSA, 1996) established three spheres of government which are “distinctive, interdependent and interrelated”, but did not specify distinct objectives for provincial government within the overall system. Currently there is no policy or legislative framework for provinces (DPLG, 2007). Local government, in contrast, was a product of conscious policy and institutional design to give effect to the precise objective for this sphere as specified by the Constitution. Local government came into being much later than the other two spheres of government, resulting in the incorporation of this sphere of government into the system of cooperative governance to be complex (DPLG, 2007). The lessons of Project Consolidate show that providing hands-on support to municipalities has had a direct benefit to local service delivery in a very short period of time. However, the long term capacity requirements of this sphere of government, mirroring the scarcity of skills in the country, will require an institutional response (DPLG, 2007).

1.2.2 *Waste institutions*

The White Paper on Integrated Pollution and Waste Management (DEAT, 2000) provides clear guidance on the roles and responsibilities of the different spheres of government.

1.2.2.1 National Government

The Department of Environmental Affairs is the lead agent for waste management-related functions including:

- Development of policy, strategy and legislation;
- Coordination;
- Enforcement;
- Dissemination of information;
- Participation in appeals (against government decisions, authorisations, etc);
- Monitoring, auditing and review; and
- Capacity building.

Other national departments with some waste-related responsibilities include:

- The Department of Water Affairs, being responsible for the protection of the water resources also from the effects of waste management practices;
- Department of Mineral Resources, being responsible for the management of “residue stockpiles” i.e. mining waste;
- Department of Health sets regulations and guidelines for medical waste and treatment facilities; and

- Department of Agriculture develops the necessary guidelines for all agricultural waste.
- Department of Energy has an interest in waste as alternative energy and Clean Development Mechanisms
- Department of Cooperative Governance and Traditional Affairs are responsible for municipal service delivery and addressing service backlogs.

1.2.2.2 Provincial government

Specific functions to be carried out by Provincial Government include:

- Development of provincial environmental implementation plans;
- Reviewing the first-generation integrated waste management plans received from the municipalities and where necessary, assisting with the drafting of these;
- Monitor compliance with provincial implementation plans and intervene if necessary;
- Develop provincial guidelines and standards;
- Develop and enforce provincial regulations for general waste collection, and supporting local government in the implementation of waste collection services;
- Act on environmental hazards as required;
- Ensure that all industries have access to appropriate waste disposal facilities;
- Quality assurance of the Waste Information System;
- Implementing and enforcing waste minimisation and recycling initiatives, and in particular, promoting the development of voluntary partnerships with industry;
- Registration and certification of hazardous waste transporters, the waste manifest system and the establishment and control of hazardous waste collection facilities; and
- Supporting the Department of Environmental Affairs in planning for a system of medical waste treatment facilities, and investigating the feasibility of centralised (regional) waste treatment facilities.

Provinces are also, in terms of the Constitution (Section 155 (6)), required to provide for the monitoring and support of local government in the province and promote the development of local government capacity to enable municipalities to perform their functions and manage their own affairs. In terms of the Presidential Delivery Agreement (COGTA, 2010), provinces are responsible for the allocation of more and appropriate resources towards the local government function to improve spending and outcomes in municipalities. Alignment and resource commitments of provincial departments must be included in IDPs. Provinces are further also required to improve support and oversight of municipalities.

1.2.2.3 Local Government

The Constitution assigns waste management services to local government i.e. refuse removal, refuse dumps and solid waste disposal (RSA, 1996). The objects of local government in terms of the Constitution are:

- To provide democratic and accountable government for local communities;
- To ensure the provision of services to communities in a sustainable manner;
- To promote social and economic development
- To promote a safe and healthy environment
- To encourage the involvement of communities and community organisations in the matters of local government.

Powers at local government level is split between district and local municipalities.

District municipalities must pursue the integrated, sustainable and equitable social and economic development of the district. It performs its role by:

- ensuring integrated development planning for the district as a whole,
- building the capacity of local municipalities to perform their functions,
- exercise local municipal powers where capacity is lacking, and
- promoting the equitable distribution of resources between the local municipalities in its area.

Functions and power of district municipalities are outlined in Section 84(1) of the Municipal Structures Act as:

- (e) Solid waste disposal sites, in so far as it relates to:
- i. the determination of a waste disposal strategy;
 - ii. the regulation of waste disposal;
 - iii. the establishment, operation and control of waste disposal sites, bulk waste transfer facilities and waste disposal facilities for more than one local municipality in the district.

Local municipalities and Metropolitan municipalities on the other hand are responsible for providing waste management services including waste collection and disposal facilities. Specific functions include:

- Compilation and implementation of general waste management plans;
- Implementation of public awareness campaigns;
- Collection of data for the Waste Information System;
- Provision of waste collection services and the management of waste disposal facilities within their area of jurisdiction; and
- Implementation and enforcement of appropriate waste minimisation and recycling initiatives, i.e. voluntary partnerships with industry and waste minimisation clubs.

1.2.3 Legal framework

The National Environmental Management, Waste Act, 2008 (Act No.59 of 2008) is the primary law regulating waste management in South Africa. The objectives of the National Environmental Management, Waste Act, 2008 include: minimising the consumption of natural resources; avoiding and minimising the generation of waste and reducing, re-using, recycling and recovering of waste; and promoting and ensuring the effective delivery of waste services [Section 2(a)]. The successful implementation of these goals largely depends on its translation into policy, strategy and legislation (including municipal by-laws).

The Municipal Structures Act, 1998 (Act No. 117 of 1998) provides for the establishment of municipalities, their internal structures and the division of powers between local and district municipalities. Section 84(1) assigns amongst other, the following functions to district municipalities:

- Integrated development planning for the district municipality as a whole, including a framework for integrated development plans of all municipalities in the area of the district municipality
- Solid waste disposal sites, in so far as it relates to:
 - The determination of a waste disposal strategy;
 - The regulation of waste disposal;
 - The establishment, operation and control of waste disposal sites, bulk waste transfer facilities and waste disposal facilities for more than one local municipality in the district;
- Municipal health services;
- Municipal public works relating to any of the above functions or any other functions assigned to the district municipality;

- The receipt, allocation and, if applicable, the distribution of grants made to the district municipality;
- The imposition and collection of taxes, levies and duties as related to the above functions or as may be assigned to the district municipality in terms of national legislation.

The Municipal Systems Act, 2000 (Act No. 32 of 2000) provides the framework for local government functioning, including integrated development planning, community participation and service delivery.

The Municipal Finance Management Act, 2003 (Act No. 56 of 2003) regulates local government finances. The Municipal Public-Private Partnership Regulations (GN. R. 309 of 1 April 2005) was issued in terms of this Act to regulate public private partnership agreements and issues related thereto.

The Intergovernmental Relations Framework Act, 2005 (Act No. 13 of 2005) provides a framework for local government’s participation in intergovernmental relations.

1.3 Composition of the sector

The waste sector is complex and not easy to outline. As such Figure 4 provides an overview of the waste management industry sector. The waste management sector provides products, systems and services aimed at collection, treatment and disposal of both hazardous and general waste.

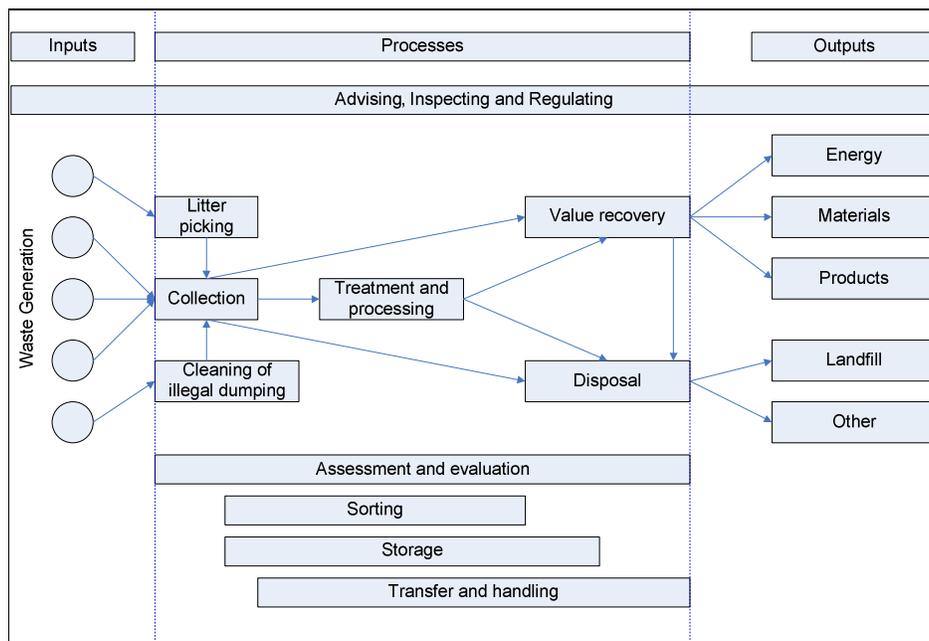


Figure 4 The waste sector (adapted from UK Environmental Agency, 2006)

The main players in the waste sector with their roles are outlined in Table 2 below (the list is not intended to be exhaustive)

Table 2: Main players in the South African Waste Sector

	Name of Organisations	Roles and Functions
National Government	Department of Environmental Affairs Department of Co-operative Government and Traditional Affairs Department of Health Department of Transport Department of Trade and Industry Department of Water Affairs Department of Agriculture, Forestry and Fisheries Department of Mineral Resources Department of Energy	Policy development Setting National Standards and Targets Advisory Regulation Inspection
Provincial Government	Provincial Departments dealing with Environmental Affairs	Standards and Targets Authorisations Advisory Regulation (e.g. permitting of all general waste sites)
Local Government	Metropolitan municipalities District municipalities Local municipalities South African Local Government Association (SALGA)	Waste service delivery Planning Waste Disposal
Associations and organisations active in the waste industry	Institute of Waste Management of South Africa (IWMSA) National Recycling Forum (NRF) Health Care Waste Forum Packaging Council of South Africa (PACSA) Recycling Action Group (RAG) Plastics Federation Paper Recycling Association of South Africa (PRASA) Electronic Waste Association of South Africa (eWASA) PET Plastic Recycling South Africa (PETCO) Buyisa-e-Bag The Glass Recycling Company Collect-a-Can SAPRO Recycling Association of SA (RASA) Responsible Packaging Management South Africa Recycling Industry Body (RIB) Rose Foundation (oil recycling) Tyre Recycling Association Scrap metal Association	Networking Information sharing Capacity building
NGOs	WESSA WWF Groundworx Earthlife Africa Other	Awareness raising Clean-up campaigns Watchdogs
Waste Contractors	Varying in size from one man contractors to large companies employing more than 1000 people.	Re-claimers Collectors Recyclers Operators of waste management facilities

		Treatment and safe disposal of waste
Industry	Any manufacturing or recycling plant Energy from waste plants	Recycling of recovered materials or waste
Professional Service Providers	Various firms	Planning, design, construction, monitoring and auditing
Suppliers	Various firms	Suppliers of equipment and materials including: Vehicles Compactors Geotextiles Receptacles Containers Bin liners Others
Academia	Universities Science Councils	Research and Development

The Strategy to Stimulate Growth in the South African Environmental Goods and Services Industry (FRIDGE, 2006) estimated the number of supplier companies in the solid waste management sector at 176 (data from 2000).

Statistics from the recycling industry revealed the following:

- There were 162 plastics recyclers in SA in 2005/6;
- In the 2007/8 more than 200 entrepreneurs were provided with the necessary equipment and personal safety gear by the Glass Recycling Company to assist with glass recycling;
- Ten companies are registered members of the Paper Recycling Association (PRASA).

During the past decade, the waste management sector has undergone significant changes internationally and its economic importance has increased considerably. The economic activity of the waste management sector is largely driven by increasing environmental regulation (Scharff, 2002). This trend is likely to become visible in the foreseeable future due to the implementation of the National Environmental Management: Waste Act, 2008 and its increased focus on reuse and recycling.

2 Vision and mission for the sector

The vision for the municipal waste sector must be closely aligned with National Environmental Management: Waste Act, 2008 and the vision for the Policy on Integrated Pollution and Waste Management (DEAT, 2000) that informed the drafting of the Act.

The proposed vision of the waste sector is therefore:

“To develop, implement and maintain an integrated waste management system which contributes to practical, sustainable waste service delivery and a measurable improvement in the quality of life of all people and the environment”(DEA, 2009a). The mission of the waste sector is therefore:

- The provisioning of appropriate and sustainable municipal waste collection services to all households in urban areas and dense settlements;

- The provision of free basic domestic waste collection services to households identified as indigent;
- The formulation of national domestic waste collection standards;
- The provision of user friendly, practical guidelines and assistance for safe waste disposal in all areas not classified as dense settlements or urban areas;
- The development of a Municipal Waste Sector Plan for addressing backlogs in waste service delivery;
- Adopting a continuous quality improvement approach to municipal waste collection services in South Africa that incorporates the 'Plan-Do-Check-Act' fundamentals; and
- The implementation of waste minimisation, reuse and recycling initiatives in collaboration with the private sector.

3 Objectives and Priorities for the Municipal Waste Sector

3.1 Strategic objectives

The objectives of this sector plan are to:

- Reduce the amount of general and hazardous waste being generated and disposed in the country;
- Ensure that all waste is disposed of appropriately – in a manner that is not detrimental to the environment and human health;
- Provide adequate domestic waste collection services across the country, thus ensuring protection of the environment from unmanaged waste, and providing all communities with access to a basic refuse removal service in line with national and provincial service delivery targets; and
- Address the remediation of areas where waste has not been managed adequately and has had a detrimental impact on the environment.

The differences between municipalities as highlighted in the new vulnerability based municipal classification system proposed in the Turnaround Strategy (COGTA, 2009) is acknowledged and will be considered in the implementation of the municipal sector plan. The presidential Delivery Agreement for Outcome 9 (COGTA, 2010) sets the baseline for household access to basic refuse removal at 64% in 2007. The target to be achieved by 2013/14 is 75% households with access to a basic level of refuse removal.

This municipal waste sector plan will only address the first three objectives. Remediation strategies for contaminated land are currently being addressed in a separate project undertaken by the Department of Environmental Affairs.

These above objectives are aligned with the objectives of the Turnaround Strategy (COGTA, 2009) namely:

- Ensuring that municipalities meet the basic service needs of communities
- Improve performance and professionalism in municipalities

Industry support will be vital towards meeting the objective of reduced waste disposal at landfill through increased recycling. Close cooperation with industry partners will be required to ensure long term sustainability of the recycling industry in South Africa.

3.2 Performance Indicators and Targets

The setting of targets are seen as a means to achieving objectives 1,2, and 3, by providing quantitative measures for tracking progress.

3.2.1 *Objective 1: Waste Reduction*

Waste reduction targets (i.e. increased recycling; decreased disposal) will have to be aligned with available technology and capacity at facilities for waste treatment, reuse, recycling and disposal of both general and hazardous waste. It will also inform the infrastructure requirements of each municipality relating to waste transfer stations, materials recovery facilities and the like. Opportunities for decreased landfilling and increased recycling are also very much dependent upon the starting waste composition. In certain situations a ceiling may be achieved to what is feasibly recycled given current technology.

The biggest opportunity with the least effort will be to focus on the reduction of domestic waste disposal to landfill. As such, targets could relate to:

- Reduction in garden waste to landfill; and
- Recycling rates of different waste streams.

3.2.2 *Objective 2: Appropriate disposal*

In relation to appropriate disposal, the emphasis should be on eliminating illegal dumping and inappropriate waste treatment technologies. Guidelines for safe on-site disposal must be communicated effectively to households in areas where on-site disposal is the most appropriate management option.

The overall target should be 100% safe disposal to a permitted landfill operating according to prescribed minimum requirements of all waste that cannot be reused, recycled or used for energy recovery purposes. A further target of 0% illegal dumping should be actively pursued.

3.2.3 *Objective 3: Municipal waste service delivery*

The overall municipal waste service delivery target is to provide waste management services to all urban and dense settlement households in South Africa. However, without measurable targets it will be extremely difficult to track any improvement in waste service delivery as well as to what extent the backlog is being addressed. Targets should therefore be set to ensure that waste services will be extended to all urban and dense settlement households (including tribal areas) over time and in line with the targets set in the Draft National Waste Management Strategy (DEA, 2010) as well as the Local Government Turnaround Strategy (COGTA, 2009) and the Presidential Delivery Agreement (COGTA, 2010). The main challenges contributing to the service backlogs (DEAT, 2009) include:

- Financial Capacity relating to:
 - Revenue arrangements and budgets;
 - Capex funding;
 - Tariffs and rates collection; and
 - Free basic services.
- Institutional capacity relating to:
 - Institutional structure;
 - Awareness creation; and
 - Integrated waste management planning.
- Technical capacity (including efficiency and productivity) relating to:
 - Waste minimisation;
 - Waste collection;
 - Waste transportation; and
 - Waste disposal.

Apart from setting targets for addressing the service backlogs, targets also need to be set to

address the challenges faced by local government in providing sustainable waste management services. In this regard, the proposed Municipal Spatial Classification System develops municipal profiles according to functionality, socio-economic profile and backlog status (COGTA, 2010). Four classes of municipalities are identified by this system:

Class 1: Most Vulnerable (57)

Class 2: Second most vulnerable (58)

Class 3: Second Highest performing (58)

Class 4: Highest performing (58)

Therefore, targets should, amongst others, relate to:

- Number of households receiving a waste management service (% reduction in backlog over time);
- Budget allocations to ensure financial support (% increased budget allocation over time);
- Equipment and infrastructure provision (% increase in available infrastructure);
- Number of staff trained or capacitated to improve service (% increase in skills and capabilities);
- Job creation opportunities generated through waste service delivery;
- Percentage of community being aware of the waste management activities; and
- Increased community involvement in municipal waste service provision.

3.3 Priority areas for activity

3.3.1 Reducing the quantities of waste disposed to landfill

Interventions to reduce waste quantities disposed of at landfill will have to focus on the minimisation, re-use and recycling of waste since there is little that a municipality can do to curb population growth rates and therefore resultant waste generation.

Specific interventions should focus on:

- Changing behaviour to encourage waste reduction, re-use and waste separation at source; thereby ensuring that increased consumption associated with economic development does not lead to increased waste generation.
- Integrating waste recycling systems into the existing and future waste management systems;
- Making use of existing waste treatment technologies, for example composting of garden waste, and finding appropriate alternative waste treatment technologies to reduce the need for disposal at landfill; and
- Introducing cleaner production principles at industries.

Education and awareness creation initiatives will be imperative to the success of interventions to reduce waste generation at source. The traditional awareness creation initiatives, for example, presentations targeting schools, and focussing on clean-up campaigns, will however not be effective to reduce waste quantities, including littering, illegal dumping and general household streams. Paying for the cleaning up of littered area also drives the wrong behaviour, e.g. littering leads to job creation. Awareness campaigns aimed at encouraging behaviour that care for the environment, changing consumer patterns or behaviour to encourage waste separation at source will be more appropriate.

Although alternative treatment technologies are listed as a potential intervention to reduce waste quantities, efforts should be focussed on pushing waste management higher up the waste hierarchy towards waste minimisation, recycling and reuse. Waste-to-energy

alternatives may amongst others, include waste derived fuels and anaerobic digestion of organic waste streams.

Attention must be given to the following aspects:

- Developing markets for recyclables;
- Providing for collection of recyclables (kerbside collection or drop-off facilities);
- Sorting of waste at transfer stations or materials recovery facilities. This may include sorting of co-mingled recyclables that were collected as part of a two bag system;
- Introduction of composting facilities (also home composting);
- Energy recovery from waste as envisaged in the Draft National Waste Management Strategy;
- The viability (both economical and operational) of the recycling industry, also in areas with lower waste quantities.

Proper landfill management practices including compaction of waste at landfill are important aspects to optimise the utilisation of available landfill airspace.

3.3.2 Financing and charges for waste services

Financing of waste management services is dependent on accurate costing of the required services. The full cost of waste service provision is seldom understood and therefore often under budgeted. Tariffs collection has the potential to fully cover the costs of providing the services, but the charges are often set below actual costs.

Interventions required for addressing financing and charging issues include the following:

- To embark on a full cost accounting exercise for waste management services in line with the draft National Waste Management Strategy targets. Given the varied local conditions in municipalities, it is recommended that the full cost accounting exercise should be undertaken at local municipality level and must include aspects of collection, transportation, landfill, street cleansing, fee collection, debt payment and depreciation.
- Development of a guideline on available sources of Capex funding and how to access these funds.
- Implementing recycling programmes will reduce waste volumes to be disposed of and as a consequence also the direct cost of waste disposal with the added benefit of generating revenue for the municipality. The cost accounting exercise referred to above could include the costs of these recycling programmes against their gains in terms of real monetary returns as well as cost savings relating to increased landfill life span through saved air space.
- Introducing the concept of Pay-as-you-throw where the service charge is proportional to the waste produced per household.

3.3.3 Institutional issues

It is not possible to prescribe institutional arrangements that will benefit all municipalities. There is however a need for a clear distinction of functions and responsibilities between district and local municipalities in view of the ever evolving environmental legal framework in the country. Furthermore, expansion of waste services to previously un-serviced areas must consider both institutional and resource requirements. In this regard community based waste management models could be considered. A decision tree to support the expansion of waste services to previously un-serviced areas or new developments is provided in Figure 5 below.

Additional interventions should include:

- Designate a Waste Management Officer as per the National Environmental Management: Waste Act, 2008.
- Strengthening municipal capacity by providing staff with the required skills to allow for the improvement of efficiency of services, improved monitoring capacity and training in solid waste management service provision options.
- Development of policy guidance on private sector participation in waste management service delivery.
- Development of legal deterrents to illegal dumping and enforcement capacity.
- Development of guidance and standards for segregation, storage, treatment and disposal of waste.

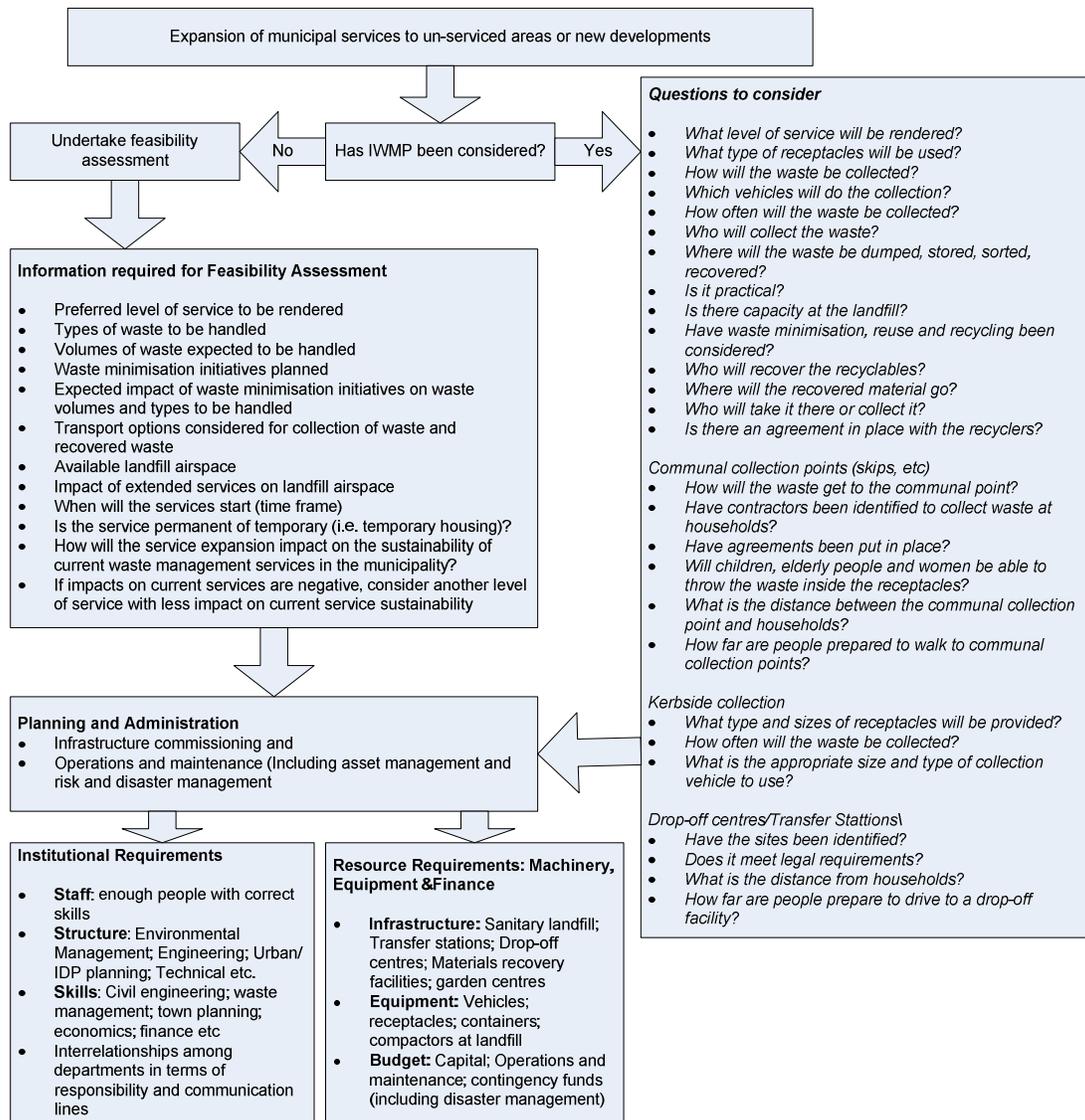


Figure 5: Decision Support tree for expansion of waste services to previously un-served areas or new developments

3.3.4 *Raising the profile of waste management at political level*

Launching of the “good citizenship” campaign as envisaged in the Turnaround strategy (COGTA, 2009: 23) provides an excellent opportunity to raise the profile of waste management. Improved prominence of the Greenest Municipality Competition could also serve to raise the political profile of waste management. In this regard, consideration should be given to escalating the Greenest Municipality competition to the same level as that of the Blue-drop and Green-drop campaigns by the Department of Water Affairs as proposed in the draft National Waste Management Strategy (DEA, 2010).

3.3.5 *Improved data and information*

Obtaining reliable data and information to support integrated waste management planning is imperative for the successful implementation of the waste information system as is required by the National Environmental Management: Waste Act, 2008. Accurate data is required to proactively determine the need for additional infrastructure and equipment.

Accurate data can be collected through the following interventions:

- Active participation in the National Waste Information System (WIS) to ensure that all waste facilities are registered and report on their respective waste quantities.
- Where weighbridges are available at landfills, it must be put into full service so that all waste being routed to that site can be correctly captured by the municipality. In this regard vehicles must be weighed on entry and again before leaving the landfill. Weighbridges must be fully operational at times corresponding to the gate hours.
- In the absence of a weighbridge, portable in-motion weighing systems can be hired and the waste arising from various parts of the municipality measured using this portable device. Furthermore, waste estimates through other means such as vehicle size combined with waste type, etc. can still be applied in cases where weighing systems are not available.
- A robust waste type analysis for each municipality is required in order to make informed decisions on new waste strategies and infrastructure development.

3.3.6 *Waste separation at source*

Government intervention will be required to support sustainable markets for source separated recyclables while municipalities must provide an enabling environment for waste separation at source. The separation at source (including through kerbside collection and buy-back and drop-off centres), ensures relatively clean recyclable materials entering the waste stream. This intervention in collaboration with the recycling industry could therefore include the establishment of one or a combination of the following:

- Buy-back and drop-off centres;
- Kerb-side collection of recyclable material;
- Materials recovery facilities for sorting of source separated recyclables.

Waste separation at source in all municipalities is the long term goal. The draft National Waste Management Strategy (DEA, 2010) targets Metropolitan and secondary cities for implementation of source separation. While buy-back and drop-off centres would be ideal in certain areas and for certain types of recyclables, the advantage of kerbside collection is that it would put separation at source within easy reach of many households that would otherwise not have taken the trouble or have the means to drive to drop-off centres.

The economics associated with the transport of recyclables to processing facilities may be a limiting factor in more rural areas. Careful planning and cooperation between smaller, more

remote municipalities may ensure large enough volumes of recyclables to be accumulated for collection at centralised transfer facilities. Close cooperation between municipalities and private sector partners may be required.

In 2007, SA recycled 1.5 million tons of packaging and paper which amounted to a recycling rate of 40.8% of all packaging and paper consumed.

3.3.7 *Phasing out of salvaging at landfills*

Theoretically, implementation of the interventions as listed in section 3.3.6 above to reduce the recoverable material being disposed of at landfill will remove the opportunity, and thus the desire, to salvage waste materials from landfills. However, this will only be successful if all recyclables are removed from the waste stream. Stricter access control to landfills and improved security measures must be instituted at landfills to discourage salvaging. The minimum requirements for landfills are clear on access control measures including:

- Gate control;
- Operating hours; and
- Fencing requirements.

It should however be noted that *“the activities of scavengers can have a great impact on the economy and waste management if the scavengers are properly organised, enlightened and provided with the necessary economic and institutional support”* (Alhumoud, 2005).

3.3.8 *Suitable land for landfills*

Interventions relating to land for landfills will mainly revolve around the following:

- The reduction of waste disposed of at landfills through implementing the waste hierarchy (prevention, minimisation, recycling which include re-use, recovery and composting, and treatment).
- The regionalisation of landfill sites. The Department of Environmental Affairs in collaboration with Provincial government and District municipalities could do a census to determine the requirements for additional landfill space and assist with the identification of potential sites for regional landfills.

3.3.9 *Optimising waste collection systems*

A number of interventions are required to address ineffective collection systems. These interventions could be clustered into:

- Awareness creation;
- Capacity building;
- Maintenance;
- Holistic planning; and
- Enforcement.

3.3.9.1 *Awareness creation*

The awareness component is threefold. Firstly, awareness of the interconnectedness of municipal services amongst municipal planners should be created. Secondly, benchmarking provides a useful means of raising awareness between municipalities of good practices with regards to effective and efficient waste collection systems. It is recommended that benchmarking must be undertaken at national level taking all good practices into consideration. Thirdly, waste collection will only be successfully implemented and optimised if community buy-in is achieved. In this regard all three spheres of government have to align their awareness campaigns to ensure that conflicting messages are not communicated.

Awareness creation includes, for example, two-way communication between municipal officials and community members, community projects, bill boards and flyers. National DEA will work closely with the Department of Education to facilitate the inclusion of waste management in the school curriculum to educate children from an early age on good waste management practices.

Awareness about the potential to earn carbon credits through good waste management practices must be raised at municipal level. The Department of Energy as the Designated National Authority for the Clean Development Mechanism (CDM) should provide guidance to municipalities on CDM projects which could earn carbon credits.

3.3.9.2 Capacity building

Failure within municipal service delivery can often be attributed to staff with insufficient experience or the incorrect qualifications or background for the job. For example, an environmental health practitioner is not necessarily qualified as a waste management specialist. While it is not always possible to recruit staff with the ideal qualification and experience for a specific position in a municipality, the necessary systems should be put in place to ensure that the required capacity is provided and that staff is sufficiently trained to fulfill their roles and responsibilities within their position in waste management services. Capacity building programmes should include aspects of training, mentoring and practical experience.

3.3.9.3 Maintenance

System, equipment and infrastructure failure in municipalities is often the symptom of poor maintenance. There are two aspects to maintenance to ensure sustainability, namely:

- Routine maintenance; and
- Repair maintenance.

A schedule for routine equipment and infrastructure maintenance is required for any system to be sustainable. Regular maintenance also has the advantage that it could inform budget planning by timeously identifying the need for replacement of capital equipment and infrastructure. Planned down time of equipment for maintenance purposes, provides for contingency plans to be put in place in order to continue important service delivery. Timeous repairs to, or replacement of broken parts further avoids unintended secondary damage and total failure of equipment and infrastructure. Good maintenance has the additional advantage of limiting the pollution impacts resulting from municipal service delivery.

3.3.9.4 Holistic planning

Efficient waste collection systems can only be achieved through holistic planning. Holistic planning requires the incorporation of integrated environmental management considerations into the development of municipal policies, strategies and programmes, all spatial and economic development planning processes and all economic activities. All elements of the environment are interlinked and management and planning must take account of connections between them.

Planning without implementation of such plans, remains a theoretical exercise and will not improve current practices. It is therefore important that plans, such as the Integrated Waste Management Plans developed by or for municipalities, be implemented as a dynamic document, continuously utilised in the short-, medium- and long-term management of waste. The plans must further be updated regularly to ensure that it remains relevant in line with changes in the municipality. It is also imperative to align the Integrated Development

Planning cycle with the integrated waste management cycle to ensure integration within the municipality.

3.3.9.5 Enforcement

Municipal by-laws on waste management, if enforced, will assist in the efficiency of waste collection systems. Despite some deficiencies, the mere enforcement of available source-based-controls, will improve the situation at community level. For instance, illegal dumping and littering is by default illegal and should be treated as such. By reducing or eliminating the need to clean illegal dumping and littering, resources currently used for such operations would be redeployed, rendering waste collection systems more efficiently. Enforcement should further be placed with a dedicated section with trained Environmental Management Inspectors in line with Chapter 7 of the National Environmental Management Act, 1998 (Act 107 of 1998).

3.3.10 Poverty eradication

The waste sector plays an important role in terms of job creation, in particular for semi-skilled and unskilled workers. Waste collection is, in particular, highly labour intensive in South Africa. The use of community-based collection of domestic waste and recyclables is becoming more prevalent and encouraged by the draft National Waste Management Strategy (DEA, 2009). These schemes have the potential to create employment, reduce cost and extending waste services to previously un-serviced areas especially in areas where municipal refuse collection is difficult and unemployment rates are high. Provided that due diligence is applied in the planning, procurement and programme administration process, community based waste collection systems can be cost effective, appropriate and successful.

The recycling industry has the potential to contribute towards job creation through materials collection and the sorting of waste. Indirect job opportunities are created for informal collectors who sell their produce to buy-back centres. The recycling industry further presents opportunities for the establishment of new enterprises such as crafts from recycled materials. These opportunities could stimulate small business development and entrepreneurial activities. There is however a need for further research to understand the recycling industry and its operations in order to estimate its potential for job creation and poverty eradication on a sustainable basis.

4 Infrastructure

Appropriate infrastructure and equipment are required to provide effective and sustainable municipal waste services in line with international best practice and economies of scale. There is a move towards regionalisation of waste management facilities (DEA, 2010). Introduction of regionalised waste management facilities requires planning for the introduction of waste transfer facilities. While reduction of waste disposal to landfill require the planning and introduction of material recovery facilities and alternative options such as buy-back centres and drop-off centres and kerb-side recovery of recyclable materials.

Information required to inform the planning of waste infrastructure development include:

- Tons of waste generated by suburb (or collection round);
- Tons of waste generated by source (domestic, commercial etc);
- Characterisation of waste (Glass, paper tin etc);
- Existing infrastructure and capacities:
 - Landfills (number, location and available lifespan);
 - Recycling facilities;
 - Transfer stations;
 - Materials recovery facilities;

- Buy-back centres;
- Drop-off centres;
- Garden waste sites;
- Composting sites;
- Retail shops offering drop-off facilities.

It is advisable that a standardised approach for waste characterisation be developed by the Department of Environmental Affairs to ensure comparable results from the different studies. All information collected should be stored in the SA Waste Information Centre.

4.1 Transfer stations

The purpose of a transfer station is to allow for the transfer of waste from the collection vehicles to bulk haulage vehicles for transport to the disposal or treatment facilities.

A number of factors need to be taken into account when planning the establishment of a transfer station. These include:

- Location;
- Routes and suitability of access roads;
- Quantities of waste to be handled at the facility; and
- Possibility to sort waste.

Specialised bulk haulage vehicles are used to haul compacted waste from transfer stations. These require suitable access roads. The possibility of bottlenecks in the route related to waste quantities of waste to be handled at the facility must be considered. Municipalities must consider the use of old landfill sites as transfer stations. The number and size of transfer facilities to be established will be determined by municipality specific conditions.

Cost outlay for the establishment of transfer stations are varying as indicated by the examples presented in Table 3 below.

Table 3: Budget outlays associated with some transfer facilities in South Africa (Ray Lombard, personal communication, 2008)

Transfer station	Budget	Waste flow (t/a)	Compaction	Investment rate (R/ton)
Nigel	R 9 million	24 000	compacted	R 375
Links Park	R 4.5 million	156 000	not compacted	R 29
Mtunzini	R 3.6 million	1 000	Not compacted	R 3 600
Bisasar Road	R 150 million	780 000	compacted	R 192
Mount Edgecombe	R 5.9 million	81 000	compacted	R 73
Hammersdale	R 4 million	39 000	Not compacted	R 103

4.2 Materials recovery facilities

The purpose of a materials recovery facility is to sort waste (mixed waste or co-mingled recyclables) for further processing and recycling. The materials recovery facilities operating in Lombardy West (Johannesburg) and at the Marianhill landfill in Durban both created 40 sustainable job opportunities. Both of these facilities were built without any contribution of investment capital by the municipality. The municipality provided the land and the power whereas the recycling company provided the plant and equipment. Examples of budget outlays associated with materials recovery facilities are presented in Table 4.

Table 4: Budget outlays associated with some material recovery facilities in South Africa

MRF	Operating company	Budget	Waste flow (t/a)	Investment rate (R/ton)
Marianhill	Re-Ethical	R 10 million	43 000	R 233.00
Lombardy West	Mama She's	R 14 million	14 400	R 972.00

The level of sophistication at such a facility will depend on the volumes of waste handled, composition of waste streams sorted and the commitment to job creation.

4.3 Buy-back centres

Buy-back centres are operated by self-employed people, i.e. where the unemployed, and under-employed, collect recyclable material in their neighbourhoods and sell these materials to the entrepreneur managing the buy-back centres that are located close to their homes. This ensures relatively clean recyclable materials since the waste is collected and sorted at source.

There are many examples of Buy-back Centres in South Africa and all are linked to the Formal Recycling Industry which provides support and guarantees to accept the material recovered at each centre. The entrepreneur is a businessman in his/her own right and usually employs a number of assistants on a permanent basis to help in the management of the facility. Further, the collectors who bring the recyclable materials to these centres derive an income for this work and may become successful entrepreneurs as well.

The feasibility of the establishment of buy-back centres will be determined by the site specific circumstances in each community.

4.4 Drop-off centres

More affluent areas need Drop-off centres where waste can be deposited by the environmentally-aware members of civil society. Again this ensures clean recyclable material for the paper recycling industry.

Drop-Off Centres also operate in different scales as can be seen in the large Bellair Road Drop-Off Centre in Cato Manor (eThekweni Metro). In this case the Drop-Off Centre is let out to a BEE contractor and his staff creating employment for six people. Smaller drop-off centres can be operated by the municipality or service provider. The City of Johannesburg extended garden waste facilities to also act as drop-off facilities for recyclables.

4.5 Unit standards for waste service delivery

It is impossible to provide generic unit standards that will be applicable to all municipalities given the variation in equipment and vehicles employed for waste service delivery.

The following unit standards (provided by the IWMSA) can however be used as rule of thumb for determining resource requirements:

Service	Standard
7 m ³ Mass container service	10 to 15 removals per day
Refuse removal (rear end compactor)	750 households per compactor per day
Garden refuse removal	300 households per vehicle per day
Street sweeping	0.5 km per worker per day (one way)
Litter picking (main roads)	1.5 km per worker per day

Human resources required for waste collection are estimated at 4 to 5 people per truck plus one driver.

5 Human resource requirements

Human resource requirements to address municipal waste management services backlogs relate to the functional clusters listed in Table 5 (pertaining to relevant legislation. The different functions can be further categorized as either support functions (i.e. not the core function of the cluster) or service functions (i.e. core function of the cluster). Functions 1, 2 and 6 may be considered support functional clusters to the three core service functional clusters, namely functions 3, 4 and 5.

Table 5: Municipal waste services functional clusters (support and service)

No	Municipal Waste Services Functional Cluster	Role
1	Planning	<i>Support</i>
2	Information (collection and reporting)	<i>Support</i>
3	Collection	<i>Service</i>
4	Disposal	<i>Service</i>
5	Waste minimization / reuse	<i>Service</i>
6	Enforcement/inspection/authorization/by-laws/compliance monitoring	<i>Support</i>

It is possible that certain of these functional clusters can be fulfilled directly by the municipality (the responsible department) or if required, contracted out to an external supplier or contractor. Functions 2, 3, 4, and 5 are considered as possible contracted functional clusters (if required and based on a Section 78 assessment), while some functions, e.g. authorisations, should preferably not be contracted out (i.e. 1 and 6).

Table 6 shows the cross-check of municipal waste management responsibilities against the identified six functional clusters.

Table 6: Confirmation of functions to identified six functional clusters functional clusters (adapted from MDALA, 2008)

MANDATED RESPONSIBILITIES	
Function	Assigned functional area
• Input to Integrated Development Plan (IDP)	1, 2
• Prepare Integrated Waste Management Plans (IWMP)	1, 2
• Provision of containers for waste	3, 1
• Community access to services	1
• City cleansing	3
• Waste collection	3
• Waste disposal	4
• Waste dumps	4
• Prohibit illegal dumps	6
• Determine levels of service	1, 3, 2
• Waste recycling	5

MANDATED RESPONSIBILITIES	
• Transport	3
• Cost recovery	1 (<i>all</i>)

Having identified the six functional clusters, the next step in determining the desired organisational structure, is to finalise whether the functional clusters should be aligned vertically, i.e. within each functional area or department, or horizontally, i.e. across each functional area or department, as shown in Figure 6. This is particularly relevant to the support functions, i.e. planning, data & information, and enforcement/inspection.

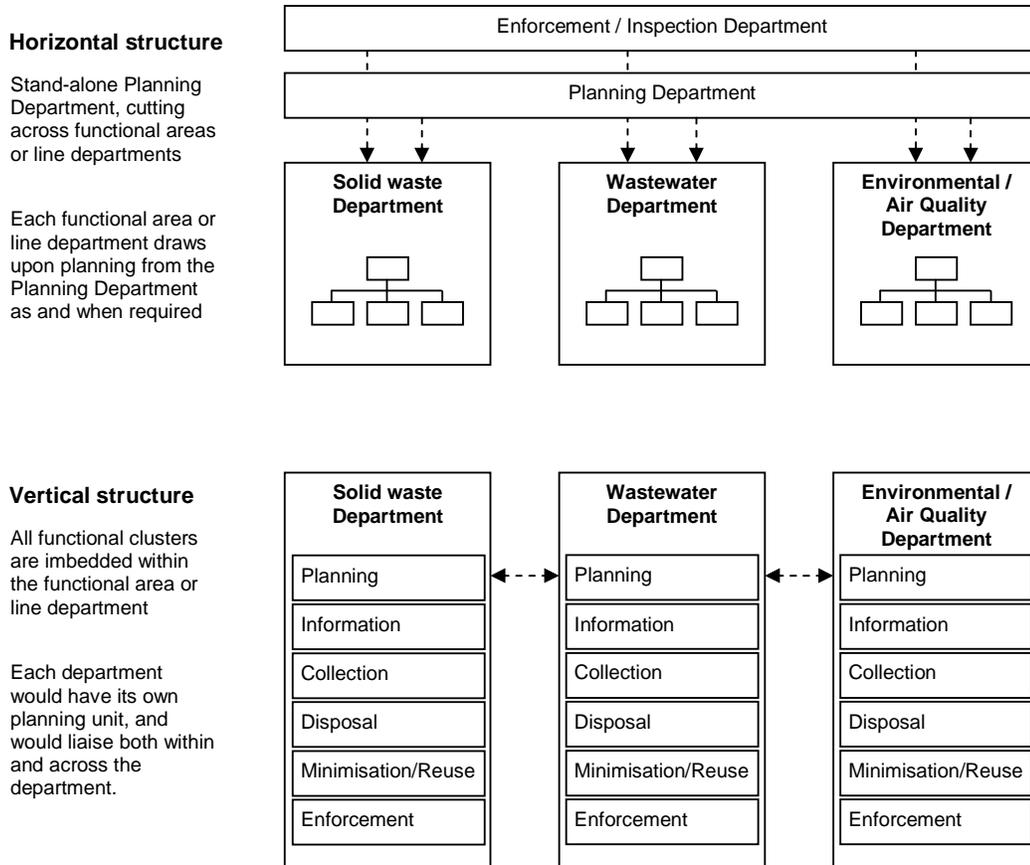


Figure 6: Horizontal and Vertical Structures for Environmental Functions (MDALA, 2008)

Functions that directly affect service delivery normally fit well into vertical structures. By identifying these functions, the focus for structure becomes the entire process, rather than individual jobs and the quantity of employees employed.

A horizontal structure for the planning function is recommended. In this way:

- functions will be organized together
- integrated planning in relation to the different functions of the categories will take place
- integration of implementation plans will be ensured
- resources will be used with greater efficiency and optimally

Support services must not be distanced 'too far' from the core functions, i.e. that the three support services reside within a completely different Directorate, e.g. Planning Directorate.

The required staff compliment to populate the structure will have to be determined based on local conditions including geographic location, population size and household densities. Introduction of a second shift for waste collection may result in more efficient use of vehicles and equipment while working hours of staff can be controlled and resultant staff issues counteracted. Another benefit of the introduction of shifts is better control over salary budgets.

5.1 Landfill operation

The Minimum Requirements for waste disposal by landfill (DWAF, 1998) stipulates that the operation of all landfill sites must be carried out under the direction of a Responsible Person as follows:

- For a communal general waste site, the responsible person may be the gate controller;
- For a small general waste site, the responsible person may be a site foreman;
- For a medium general waste, the responsible person may be a site superintendent;
- For large general waste sites, the responsible person may be a landfill manager and a post-matric or tertiary qualification is recommended;
- All hazardous waste sites require a responsible person with at least an academic qualification equivalent to a BSc Degree with a Chemistry major and suitable experience. The responsible person must also have a good grasp of waste classification.

The responsible person must, in all cases, be supported by suitably qualified and competent staff. The required staff compliment will be determined by the size and type of the operation as well as the facilities involved (DWAF, 1998).

6 Action plan

The required interventions necessary to address the waste service backlog in South Africa will vary depending on site specific circumstances. The Action plan is attached as Appendix 1.

Time frames indicted in Appendix 1 are:

Short term: 0-4 years

Medium term: 5-10 years

Long term: 11-15 years

6.1 Monitoring and reporting

There is a host of monitoring and reporting requirements contained in national and provincial legislation to which local municipalities must comply. These requirements relate to amongst others finances, performance in terms of service delivery (including waste management service delivery), state of the environment reporting and now also waste management reporting. It is impossible to list all reporting requirements; therefore this section will focus on the reporting requirements bestowed on municipalities relating to waste management and waste management service delivery.

As all municipalities are required to develop integrated waste management plans, annual performance reports on the implementation of the IWMP is required in accordance with Section 13 of NEMWA. Municipalities are therefore required to monitor progress with meeting the targets set in the IWMP. In addition, a customer satisfaction survey is required in terms of the performance audit as outlined in Section 55(1) of the Local government:

Municipal Systems Act No 32 of 2000. This customer satisfaction survey must include all services provided by or on behalf of the municipality including waste management services.

The Waste Act, 2008 prescribes the establishment of a national waste information system (SAWIS) for the recording, collection, management and analysis of data and information that must include data on the quantity and type or classification of waste generated, stored, transported, treated, transformed, reduced, re-used, recycled recovered and disposed of. The SAWIS may include information on the levels and extent of waste management services provided by municipalities. Municipalities are therefore required to report in terms of the requirements of the SAWIS and provincial waste information systems.

Other requirements as prescribed by law include the following:

- Integration of IWMPs into IDPs
- Providing waste services at affordable price
- Keeping separate financial statements including a balance sheet of the services provided.
- Designation of a waste management officer
- IWMP submitted to MEC for approval – approved IWMPs to be uploaded to the SAWIC
- Content of IWMPs must adhere to Section 12 of the NEMWA
- Licences for all waste management facilities owned by the municipality
- Monitoring, auditing and reporting requirements as stipulated in the waste management licence

Monitoring and reporting mechanisms must be put in place to monitor the progress being made towards addressing the waste service backlog. The key performance indicators and targets (DEA, 2009) must be used for reporting purposes.

The end target should be determined as the date when all backlogs must be eradicated. The indicator process should also recognise that meeting these targets will in reality become an iterative process. It may thus be necessary to propose interim targets such that, over time, the final target is reached. Table 7 below is a summary of the indicators and associated targets that should be used as basis for further consultation and discussions.

Table 7: Summary of Proposed Waste Indicators and Targets as basis for further consultation and discussion

Type	Indicator	Units	Interim Targets	Proposed Targets
Input	Waste services budget per capita	R/capita		To be determined per municipality
Input	Waste service budget per household/consumer unit	R/household		To be determined per municipality
Input	Waste services budget as proportion of full cost of delivery	%	Increase by 10% per year until 100%	100%
Input	Waste service budget per m ³ waste generated	R/ m ³	Increase by 10% per year until 100%	100% of actual cost
Process	Total waste service staff per capita	staff/capita		1/200
Process	Staff structure (Labour:Intermediate:Management)	ratio		65:25:20 (to be tested in RSA conditions)
Process	Annual carrying capacity of waste removal as proportion of waste generated	%	Increase by 10% per year until 100%	100%
Process	Planning staff per capita	Staff/capita		Municipality specific
Process	Position of waste management on priority list		Moving up the priority list	High
Process	Existence of backlog indicators	Yes/No		Yes
Output	Proportion of households receiving a basic level of service	%	Increase by 10% per year until 100%	100%
Output	Proportion of generated waste collected	%	Increase by 10% per year until 100%	100%
Output	Volume of waste illegally dumped per year	m	Decrease by 10% per year	0
Impact	Proportion of households receiving adequate and sustainable waste service delivery	%	10% increase per annum until 100%	100%

7 References

- Alhumoud, J.M (2005) Municipal solid waste recycling in the Gulf Co-operation Council states. *Resources, Conservation and Recycling* 45: 142–158
- Bai, R and Sutanto, M. (2002). The practice and challenges of solid waste management in Singapore. *Waste Management* 22: 557-567.
- Ball, J. (2006). Waste management in developing countries: Seven characteristics and seven principles. *Conference proceedings of the Waste2006 conference* held in Stafford-upon-Avon, Warwickshire, UK. Conducted by The Waste Conference Limited.
- Coetzee, B. (2006). Bridging the gap between traditional vs. integrated waste management – A South African Perspective. *Proceedings of WasteCon 2006. International Waste Management Biannual Congress and Exhibition*. Somerset West, Cape Town, 5-8 September 2006.
- Community Agency for Social Enquiry (CASE) (2003) Municipal Cost Recovery in Four South African Municipalities. Researched for the built environment support group.
- Department of Cooperative Governance and Traditional Affairs (COGTA) (2009) Local Government Turnaround Strategy – Working together, turning the tide in local government. Department of Cooperative Governance and Traditional Affairs, Pretoria.
- Department of Cooperative Governance and Traditional Affairs (COGTA) (2010) Delivery Agreement for outcome 9: A responsive accountable, effective and efficient local government system. 5 July vs 4 EIA WIP.
- Department of Environmental Affairs (DEA) (2010) National Waste Management Strategy First draft for public comment. February 2010.
- Department of Environmental Affairs and Tourism (DEAT) (1999) National Waste Management Strategies and Action Plans South Africa: Strategy Formulation Phase: National Waste Management Strategy Version D.15 October 1999.
- Department of Environmental Affairs and Tourism (DEAT) (2000) White Paper on Integrated Pollution and Waste Management for South Africa: A policy on pollution prevention, waste minimisation, impact management and remediation. Department of Environmental Affairs and Tourism, Pretoria. ISBN 0-621-3002-8.
- Department of Environmental Affairs and Tourism (DEAT) (2001). The Polokwane Declaration on Waste Management. First National Waste Summit, Polokwane, South Africa. 26-28 September 2001.
- Department of Environmental Affairs and Tourism (DEAT) (2002). Municipal Solid Waste Tariff Strategy. Department of Environmental Affairs and Tourism, Pretoria.
- Department of Environmental Affairs and Tourism (DEAT) (2005) Implementation plan for Transfer of the Waste Permitting Function.
- Department of Environmental Affairs and Tourism (2006). Implementation Plan for Transfer of the Waste Permitting Function. Department of Environmental Affairs and Tourism: Pretoria

- Department of Environmental Affairs and Tourism (DEAT) (2007). Assessment of the Status of waste service delivery and capacity at local government level. Department of Environmental Affairs and Tourism, Pretoria.
- Department of Environment Affairs and Tourism (DEAT) (2007a) Strategic Plan for the Environmental Sector 2008-2013.
- Department of Environmental Affairs and Tourism (DEAT) (2009) Addressing Challenges with Waste Service Provision in South Africa: Waste Sector Challenges and Vision Report.
- Department of Provincial and Local Government (2007). Speech for the Minister for Provincial and Local Government, Ms N. Hanga to be delivered at a conference on waste management staged at the Emperors Palace, Johannesburg, from 22-23 March 2007.
- Department of Provincial and Local Government (DPLG), 2007. Policy process on the System of Provincial and Local Government: Background: Policy Questions, Process and Participation. Government Notice 936 Government Gazette No 30137 of 1 August 2007.
- Department of Water Affairs and Forestry (DWAF). (2001). *Waste Generation in South Africa*. Water Quality Management Series. Pretoria.
- Department of Water Affairs and Forestry Second Edition (DWAF) (1998) Waste Management Series. Minimum Requirements for Waste Disposal by Landfill.
- Emalahleni Local Municipality (2007). Emalahleni Local Municipality Integrated Development Plan, March 2007. Accessed from: http://www.emalahleni.gov.za/idp_sdbip.html.
- Fiehn, H and Ball, J. (2005). Background research paper: Waste. South Africa Environment Outlook. National State of the Environment Project. Department of Environmental Affairs and Tourism: Pretoria
- FRIDGE. (2006). Strategy to stimulate growth in the South African environmental goods and services industry. Fund for Research in Industrial Development, Growth and Equity (FRIDGE).
- Godfrey, L. and Dambuza, T. (2006). Integrated Waste Management Plans – A useful management tool for Local Government or a bureaucratic burden? WasteCon 2006 Biennial International Waste Congress and Exhibition, Somerset West, Cape Town, South Africa, 5-8 September 2006.
- Godfrey, L and Oelofse, S. (2008). A Systems approach to waste governance – unpacking the challenges facing local government. Proceedings Waste 2008: Waste and Resource Management – a Shared Responsibility, Stratford-upon-Avon, Warwickshire, England, 16-17 September 2008
- Hazra, T and Goel, S. (2009). Solid waste management in Kolkata, India: Practices and Challenges. *Waste Management* 29: 470-478.

- Henry, R.K., Yongsheng, Z and Jun, D. (2006) Municipal solid waste management challenges in developing countries – Kenyan case study. *Waste Management* 26: 92-100.
- Jin, J, Wangm Z and Ran, S. (2006) Solid waste management in Macao: Practices and challenges. *Waste Management* 26:1045-1051.
- Mbombela Local Municipality (2007). Integrated Development Plan 2006-2011. Review 2007/08. Accessed at <http://www.mbombela.gov.za>
- Moghadam, MRA, Mokhtarani, N and Mokhtarani, B. (2009). Municipal solid waste management in Rasht City, Iran. *Waste Management* 29: 485-489.
- Mpumalange Department of Agriculture and Land Administration (MDALA) (2008) Development of a Municipal IPC Model for Mpumalanga: Institutional Framework.
- Nhamo, G., Oelofse, SHH, Godfrey, L and Mvuma, G. (2009). WasteCon '08 Workshop Report: Unpacking Governance Opportunities and Challenges for Integrated Municipal Waste Management in South Africa. CSIR document No CSIR/NRE/PW/IR/2009/0034/B.
- Oelofse, SHH and Godfrey, L (2008a) Defining waste: Are we beyond the age of 'waste'? *SA Journal of Science* 104 (7/8) 242-246.
- Oelofse, S.H.H. and Godfrey, L. (2008b). Towards improved waste management services by local government – A waste governance perspective. *Proceedings of Science: real and relevant Conference*. 17-18 November 2008, Pretoria.
- Oelofse, S.H.H., Godfrey, L, Rascher, J and Sherwood, L. (2008) Minimising the effects of waste on society – A waste governance perspective. *Proceedings of WasteCon 2008. International Waste Management Biannual Congress and Exhibition*. Durban 6-10 October 2008.
- Pokhrel, D and Viraraghavan, T. (2005) Municipal solid waste management in Nepal: practices and challenges. *Waste Management* 25: 555-562.
- Poswa T.T. (2004) The importance of Gender in waste management planning: A challenge for solid waste managers. In: *Proceedings of the 8th World Congress on Environmental Health*, Durban, 22-27 February 2004. ISBN 0-9584663-7-8.
- Purnell, G. (2009) National Waste Quantification and Waste Information System. Research Paper towards the development of a National Waste Management Strategy.
- Republic of South Africa (RSA) (1989). Environment Conservation Act, No 73 of 1989 as amended.
- Republic of South Africa (RSA) (1996) The Constitution of the Republic of South Africa, Act No 108 of 1996.
- Republic of South Africa (RSA) (1998). National Water Act, No 36 of 1998. *Government Gazette* 19182 Vol 398. Government Notice 1091 of 26 August 1998 as amended.
- Republic of South Africa (RSA) (2007). National Environmental Management: Waste Bill [b 39D-2007]. ISBN 978-1-77037.

- Sakai, S., Sawell, S.E., Chandler, A.J., Eighmy, T.T. Kosson, D.S., Vehlow, J., Van der Sloot, H.A., Hartlén and Hjelmar, O. (1996). World trends in municipal solid waste management. *Waste Management* 16, 341-350
- Scharff, C. (2002) Editorial. *Waste Management and Research* 20: 387-388.
- Statistics South Africa (Stats SA) (2007). General Household Survey 2007. Statistical release P0318. Available online at: www.statssa.gov.za.
- UK Environmental Agency (2006) Improving environmental performance: Sector Plan for the waste management industry. Available online: <http://publications.environment-agency.gov.uk>
- Vidanaarachchi, C., Yuen, STS, and Pilapitiya, S. (2006). Municipal solid waste management in the Southern province of Sri Lanka: problems, issues and challenges. *Waste Management* 26:920-930.
- Yhdego, M. (1995). Urban solid waste management in Tanzania: Issues, concepts and challenges. *Resources, Conservation and Recycling* 14: 1-10.
- Yuan, H, Wang, L, Su, F and Hu, G. (2006) Urban solid waste management in Chongqing: Challenges and opportunities. *Waste Management* 26: 1052-1062.

Appendix 1 Action Plan for addressing the waste services backlogs

INTERVENTION	ACTIONS	TIME FRAME*	RESPONSIBILITY	COMMENTS
<i>Waste Quantities</i>				
Integrating waste recycling systems into existing and future waste management systems.	Develop/Upgrade and implement Integrated Waste Management Plans (IWMPs).	Short term	Municipalities and Provinces	An IWMP is intended to ensure the integration of all aspects of waste management within a municipality in order to ensure effective and efficient operations as well as optimum utilisation of available resources. This document would therefore ensure the integration of waste recycling systems into existing waste management systems and investigate alternative waste treatment and disposal options.
Making use of appropriate alternative waste treatment technologies to reduce the need for disposal at landfill.	Providing for collection of recyclables (kerbside collection and drop-off facilities).	Long term	Municipalities Recycling industry	
	Establishment of Material Recovery Facilities (MRFs).	Medium term	Municipalities, Provinces, National Recycling industry	
	Investigate and implement further recycling/reuse options e.g. composting, energy recovery etc.	Short – Medium term	National, Province and Municipalities Recycling industry	
Introduce Cleaner Production principles for industry.	Finalisation, adoption and implementation of the National Cleaner Production Strategy	Medium term	DTI	DEAT developed a National Cleaner Production Strategy which was never adopted in 2004. In view of the national Cleaner Production Centre which falls under the DTI, it is envisaged that the DTI is the relevant Department to finalise the adoption and implementation of the strategy.
Changing behaviour to encourage waste reduction, re-use and waste separation at source.	Develop and implement a Waste Minimisation/Reduction Strategy. Including Targets for waste minimisation and reduction of waste to landfill. Develop an Awareness and Capacity building strategy.	Medium to long term	National, Province and Municipalities Recycling industry	A Waste Minimisation/Reduction Strategy should be developed on the basis of the IWMP. This should identify programmes that give incentives for waste reduction.

INTERVENTION	ACTIONS	TIME FRAME*	RESPONSIBILITY	COMMENTS
<i>Financing and charges for waste</i>				
Provide guidance to municipalities on how to undertake a full cost accounting exercise	Develop a full cost accounting guideline for municipalities	Short term	DEA	
Embark on a full cost accounting exercise for waste management services.	Develop/Upgrade and implement Integrated Waste Management Plans (IWMPs).	Short term	Municipalities	An IWMP would involve a full cost account of different waste management scenarios in order to ensure the effectiveness and sustainability of recommended systems.
Guidance on available sources of CAPEX funding.	Develop a CAPEX Funding Guideline.	Short term	DEA	DEA as a national department can liaise with potential funders to establish potential CAPEX funding options and advise municipalities accordingly through the CAPEX Funding Guideline.
Financially sustainable waste programmes.	Develop and implement a Waste Minimisation/Reduction Strategy.	Medium term	National, Province and Municipalities	The strategy would identify financially viable programmes.
Derive a service payment model which will recover the costs of the service without disadvantaging the poor.	Develop a service fee calculator which can be adapted by local municipalities.	Short term	DEA	The calculator would ensure that all the service costs are included in the fee determination process. Furthermore this will also ensure consistency in cost setting throughout the country.
<i>Institutional Issues</i>				
Strengthening municipal capacity by providing staff with required skills.	Undertake a capacity needs assessment	Medium	Municipalities	This study would ensure that appropriate resources are allocated for the needs of any specific municipality.
	Designate a Waste Management Officer	Short term	Provinces and Municipalities	
	Adopt a performance and development management system which will allow performance management	Short term	Municipalities	The Department of Provincial and Local Government (now COGTA) developed a performance Management Guide for municipalities in 2001. This or any other

INTERVENTION	ACTIONS	TIME FRAME*	RESPONSIBILITY	COMMENTS
	while offering the necessary developmental support.			guideline could be used.
Development of a Policy Guideline on private sector participation in waste management services.	Development of Integrated Waste management Policy	Short term	Provinces and Municipalities	
<i>Political buy-in</i>				
Education and awareness creation.	Develop an Awareness and Capacity building strategy.	Medium term	National, Province and Municipalities	Political buy-in is required from all levels of government. Having these strategies in all spheres would reinforce the message being communicated. This would also ensure consistency in the campaigns made and collaborations where possible.
	Launch the Good citizenship campaign advocated for in the Local Government Turnaround Strategy (COGTA, 2009)	Short to medium term	Municipalities	
	Elevate The Greenest Municipality Competition to the Blue-drop and Green-drop campaigns championed by Water Affairs.	Short to medium term	National	
<i>Data and information</i>				
Keep accurate reliable waste data.	Undertake a national waste survey.	Short term	DEA	
	Update the waste backlog survey.	Short term	DEA	Municipalities should be able to report on backlogs on an annual basis
	Proper record keeping at all waste facilities.	Short term	Municipalities	In the absence of weighing devices such as weighbridges, best estimates based on vehicle size and loads should be recorded. Proper access control to waste facilities is a prerequisite for proper record keeping

INTERVENTION	ACTIONS	TIME FRAME*	RESPONSIBILITY	COMMENTS
	Linking of all municipal facilities onto the National Waste Information System (WIS).	Short term	DEA and Provincial Environmental departments	On-going reporting of information is essential in ensuring good reliable waste data.
	Training and support on WIS for all municipalities.	Short term	DEA and Provincial Environmental departments	
<i>Separation at Source</i>				
Create an enabling environment to encourage waste separation at source.	Provision of facilities and containers for recyclables.	Medium term	Municipalities	Drop-off centres, buy-back centres, MRFs can be run as joint ventures on garden waste sites, at landfills etc Small municipalities can collaborate on establishment of joint facilities
	Develop an Awareness and Capacity building strategy.	Medium term	Provincial Environmental Departments, Municipalities	Educating the public about the importance of separating their waste is key to the ensuring a success of this initiative.
	Negotiate and establish/create markets for the recycled products.	Short term	DEA DTI Industry	In order to ensure a sustainable recycling industry, there is a need to ensure that there are markets for the products.
	Update by-laws to support waste separation at source	Medium term	Municipalities	
<i>Salvaging at landfills</i>				
Ensure that all landfill site are permitted and comply to their permit conditions.	Regular compliance monitoring of landfill sites to ensure among others, proper fencing, access control and strict adherence to operating hours.	Short to medium term	Municipalities, provinces	
Reduction of the amount of waste disposed to landfill.	Develop and implement a Waste Minimisation/Reduction Strategy.	Medium term	DEA, Provincial Environmental Departments, Municipalities	The livelihood of people making a living from picking at landfills should be considered in the development of these strategies. Consider the establishment of cooperatives to formalise

INTERVENTION	ACTIONS	TIME FRAME*	RESPONSIBILITY	COMMENTS
				landfill salvagers.
<i>Lack of suitable land for landfill sites</i>				
Reduction of the amount of waste disposed to landfill.	Undertake a General Technological Assessment for waste treatment and/or disposal for the country.	Short term	DEA	Identify alternative technology options for different waste streams
	Develop and implement a Waste Minimisation/Reduction Strategy.	Medium term	DEA, Provincial Environmental Departments, Municipalities	Reduction targets must be measurable and attainable
Regionalisation of landfill sites.	Determine the need for regionalisation as part of the IWMP process.	Short term	District Municipalities	A district IWMP would identify where there are possibilities of establishing regional facilities.
<i>Optimising waste collection systems</i>				
Awareness creation and capacity building	Bench marking of waste collection systems	Medium term	National	
	Adopt a performance and development management system which will allow performance management while offering the necessary developmental support (This may include training, mentoring and practical experience).	Short term	Municipalities	