

WASTE AND SANITATION



INTRODUCTION

South Africa and the Western Cape are confronted by waste management challenges driven by population growth and the need to redress environmentally unacceptable waste management practices. In seeking solutions, South Africa has engaged in debate raised in international forums which has influenced domestic law and waste management trends locally (Glazewski, 2000). Local agreements have emerged and, combined with the international debate, South African waste management strategies have been guided by various instruments, including:

- the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989 (the Basel Convention)
- the Convention of Prior Informed Consent, 1998 (the Rotterdam Convention)
- the Convention on the Ban of the Import of Hazardous Waste into Africa, 1991 (Bamako);
- The Polokwane Declaration (2001) calling for a 25% reduction in waste disposal by 2012 and zero waste disposal in South Africa by 2022.

A draft National Integrated Waste Management Bill is expected to be submitted to Parliament in 2006 for promulgation. Presently, waste management is the responsibility of the provincial District Municipalities in partnership with private companies. Section 20 of the Environmental Conservation Act No 73 of 1989 (ECA) and the National Water Act No 36 of 1998 mandate the Department of Water Affairs and Forestry (DWAF) to regulate the management of waste disposal sites and to impose restrictions on waste production and disposal activities threatening the country's water resources. This mandate may transfer to the Department of Environmental Affairs and Tourism (DEAT) in future.

The ECA defines waste as “...any matter, whether gaseous, liquid or solid or any combination thereof, originating from any residential, commercial, industrial or agricultural area identified by the Minister of Environmental Affairs and Tourism as an undesirable or superfluous by-product, emission, residue or remainder of any process or activity.” Mining and radioactive waste is not included and is therefore not controlled under the ECA.

It is estimated that about 90% of the total waste generated in South Africa is disposed of on land (Lazarus et. al.: 1997). The focus of this theme is solid waste and liquid waste (or sanitation). Gaseous waste is addressed under the ‘air quality’ theme.

The priority issues reported on in this theme include:

- increasing waste generation;
- provision of efficient solid waste management services; and
- sanitation and the provision of associated services.

DRIVERS AND PRESSURES

Some of the driving forces and pressures that influence waste management and sanitation in the Western Cape include:

Integrated Waste Management (IWM) – The principles and thinking underlying IWM are placing pressure on authorities to change the way in which they practice waste management. IWM is only effective if viewed as an integrated activity, relying on the active participation of many role players. IWM involves the planning of waste management activities by developing Integrated Waste Management Plans (IWMPs). These plans are tools for local authorities to implement the waste management hierarchy (Figure 8.1), defined as follows:

- *Waste Reduction/Minimisation* – the prevention of production of certain waste types by regulation (e.g. the recently successful thin plastic bag ban) or the

economic reduction of waste volume by clean technology implementation;

- *Waste Re-use/Recycling* – the use of waste from one process as raw materials for another or the recovery of energy through incineration and/or biodegradation;
- *Waste Treatment* – aimed at reducing the classification (removing hazardous components) or volume of waste through treatment;
- *Waste Disposal* – responsible, environmentally friendly and legally compliant disposal of waste.

For example, the composting of garden waste for use in gardens would be a way to re-use waste and the composting for household waste for landfilling would be a way to reduce waste.

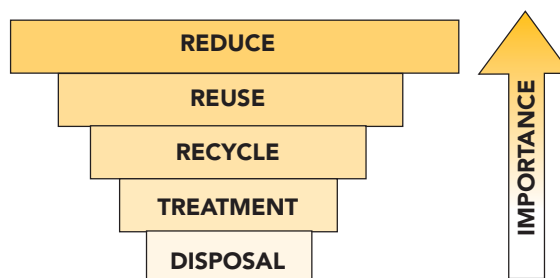


Figure 8.1: Waste Management Hierarchy

Population growth – population growth and migration into the Western Cape, is a driver that influences the amount of waste generated, as well as the demand for waste and sanitation services.

Industrial and urban development – Waste and sanitation services need to keep pace with industrial and urban development. Often these essential services are forgotten and development is approved without enough thought and funding for the associated waste services. This places immense pressures on existing service infrastructure and often results in facilities exceeding their capacity.

Apartheid planning legacy – apartheid planning policies resulted in large inequalities in the provision of waste disposal and sanitation services. The Western Cape is still struggling to address and overcome these inequalities.

Public awareness – public demands to increase re-cycling and reduce waste disposal is a factor which influences and strengthens the drive to implement and enforce IWM strategies. Conversely, public ignorance or lack of awareness hampers efforts to implement IWM.

Limited space for disposal and treatment – Limited space for landfills and wastewater treatment facilities and the difficulty of finding suitable sites near urban centres is one of the driving factors behind the move towards waste reduction and increased re-cycling.

Lack of funding – Lack of sufficient funding to meet the increasing costs of waste management is a serious constraint in the province. This is often due to a lack of understanding of the complexities of waste management, and therefore commitment by decision makers. This is a major stumbling block to the implementation of IWM in the Western Cape.

ISSUE: INCREASING WASTE GENERATION

Waste is grouped into two classes (DWAF, 1998):

- **General waste (G)** includes domestic, commercial, some industrial waste, and builder’s rubble;
- **Hazardous (H & h) waste** is waste that has the potential to have significant adverse effects on public health and the environment because of its inherent toxicological, chemical and physical characteristics, and includes inorganic waste (e.g. heavy metal sludges), organic waste, putrescible organic waste (e.g. waste that contains small quantities of highly dispersed hazardous substances); and miscellaneous waste (e.g. infectious waste).



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Global trends indicate an increase in the amount of waste being generated (general and hazardous), a phenomenon closely related to an expanding population and the increasing production of goods (DEAT: 2002). Furthermore, increased living standards (per capita income) give rise to increased waste generation. The Western Cape and Gauteng are the only provinces with positive net migration statistics. This is likely to be influencing and contributing to increasing waste generation in the Western Cape. (Census 1996, 2001; Stats SA release P0302 – July 2004).

Managing the increased volumes of waste has become challenging from a service provision and disposal point of view, particularly since there is a lack of reliable 'waste generation accounting'. The result is that waste generation statistics are generally not measured, but estimated from population statistics assuming various per capita waste generation rates across income groups. Discrepancies in waste generation estimates have resulted. Table 8.1 lists available estimates and highlights the range in values.



Further to the data contained in Table 8.1, the study carried out in 2001 titled "Situation Analysis of Waste Management within Local Authorities in the Western Cape" indicated that the Western Cape generated 1 446 499 m³ of waste. DWAF, however, estimated that 8 543 000 m³ of waste was produced in the Western Cape in 1998 (extrapolated from the 1996 Census). Despite these discrepancies, it is evident that the generation of general waste is increasing in the Western Cape. DWAF estimate that over 50% of all general waste

currently being disposed of in landfills in the country has the potential to be re-used or re-cycled (DWAF, 1998 In: Dept. Agriculture Conservation and Environment, 2004)

IWM is considered the appropriate waste management strategy in South Africa, but the development of integrated waste management plans and waste information systems has not yet been achieved by most District Municipalities in the Western Cape, and consequently the uncertainty in data presents a vital data gap. Since no accurate data for general waste exists, the indicator below reflects the increase in waste generation of hazardous waste.

Percentage Hazardous Waste Generation per Province

There are three hazardous waste landfills in the Western Cape, two at Vissershok in Cape Town; one of these is a private site able to accept (H:H)²³ waste and the other a municipal site able to accept (H:h)²⁴ waste. The third hazardous waste landfill is situated in Mossel Bay and is also a private site. Limited statistics are available that describe hazardous waste generation in the Western Cape. However, indications are that, associated with population and industrial growth, there is likely to be an increase in the hazardous waste generated. This was the finding in the Gauteng SoER (Dept. Agriculture,

Table 8.1: Variations in Estimated Solid Waste Generation in the Western Cape (Available data in tonnes/year)

	1996	2001		2004
Data Source	C	A	B	C
West Coast		49,235	157,779	
Cape Metropolitan Area	650,000	1,079,014		2,158,523
Cape Winelands (Boland)		159,585		
Overberg		43,619	38,033	
Garden Route-Klein Karoo		108,853		
Central Karoo		6,194		

Note:

A. Situation Analysis/Baseline Study for Waste Management for the Western Cape - June 2001

B. Municipal Solid Waste Disposal Strategy (2001): Draft Document for the West Coast District Municipality: Entech Consultants (Pty) Ltd

C. Integrated Waste Management Plan: City of Cape Town; Final Status Quo Report (2004)

23. H:H landfills can accept all hazard ratings and general waste

24. H:h landfills can only accept hazard ratings 3 and 4, and general wastes

Conservation and Environment, 2004). Table 8.2 describes a comparison of hazardous waste generation between the nine provinces (1998).

Medium to low level nuclear waste²⁵ that is produced by the Koeberg nuclear power plant is currently disposed of outside the province at Vaalputs in the Northern Cape. High level waste²⁶ is currently stored on-site at Koeberg. Aside from nuclear waste, the Western Cape has a small contribution (3%) to the hazardous waste stream generated in South Africa compared to Gauteng and Mpumalanga, where mining generates most hazardous waste.

Incineration is used on a small scale in the Western Cape, mainly to dispose of medical, pharmaceutical, abattoir and veterinary wastes. There are 10 waste incineration sites in the Western Cape, the majority of these being situated in the Cape Metropolitan Area (CMA). Approximately 80% of the medical waste generated in the Western Cape in 2002 was incinerated.

Table 8.2: Hazardous waste produced in each of the provinces in 1998 (Source: DWAF, 1998).

Province	Hazardous Waste (m ³ /a)	% per province
Mpumalanga	3 039 873	31.8
Gauteng	2 829 643	29.6
Kwazulu-Natal	1 702 934	17.8
North West	1 618 383	16.9
Western Cape	283 887	3.0
Eastern Cape	52 088	0.5
Free State	30 530	0.3
Limpopo Province	5 814	0.1
Northern Cape	1 149	0.0
TOTAL	564 301	100

Note: the figures contained in the table above include mining waste

IMPACTS

The impacts of increasing waste generation are significant. Long term or cumulative pollution effects from waste generation are likely to have the following impacts:

- Increasing waste generation is placing pressure on the land available for disposal. The need for new areas for waste disposal can also lead to the transformation of natural habitats and the loss of biodiversity.
- The earth and its water bodies have a limited capacity to assimilate and breakdown waste. Pollution of surface/groundwater resources and soil can result from waste sites, especially if they are poorly managed.
- Air pollution by dust and/or wind blown litter as well as emissions such as methane gas from landfill sites increase with increasing waste generation.
- Increasing waste generation requires additional resources to keep up with the increasing demands for waste collection and disposal services.
- The potential for nuisance from odours and aesthetic disfiguration from solid waste sites increases with increasing waste generation.

25. Low level waste is waste which has a specific activity less than 74 Bq/g and total activity less than 3.7 kBq

26. High level waste is waste which has a specific activity greater than 74 Bq/g and total activity greater than 3.7 kBq

ISSUE: PROVISION OF EFFICIENT SOLID WASTE MANAGEMENT SERVICES

Poor service provision may have a variety of consequences, such as encouraging a culture of illegal waste dumping. Waste management services in the Western Cape therefore need to maintain and improve service delivery in all waste-producing sectors.



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Percentage Collected and Not-Collected Waste per District Council

Formal waste removal to a landfill site as opposed to ad hoc service provision reduces the need for area cleaning programmes that are taxing on resources and can cost up to 8 times that of removing containerised waste (WESGRO – 2002).

Currently, waste is removed weekly or less often in 88,6% of households in the Western Cape, leaving 11,4% of households to rely on communal refuse dumps, their own refuse dumps or no waste disposal. For these people, service

provision can, at best, be described as ad hoc and the concept of applying IWM is at an immediate disadvantage. Figure 8.2 shows the waste removal vs non-removal for each of the District Councils between 1996 and 2001.

Service provision improved between 1996 and 2001, with the City of Cape Town outperforming the District Councils.

Percentage of Permitted Landfill Sites

Improving waste removal services is also dependent on providing environmentally acceptable means of waste disposal and is not just a function of collection services. Currently, local authorities in the Western Cape face obstacles

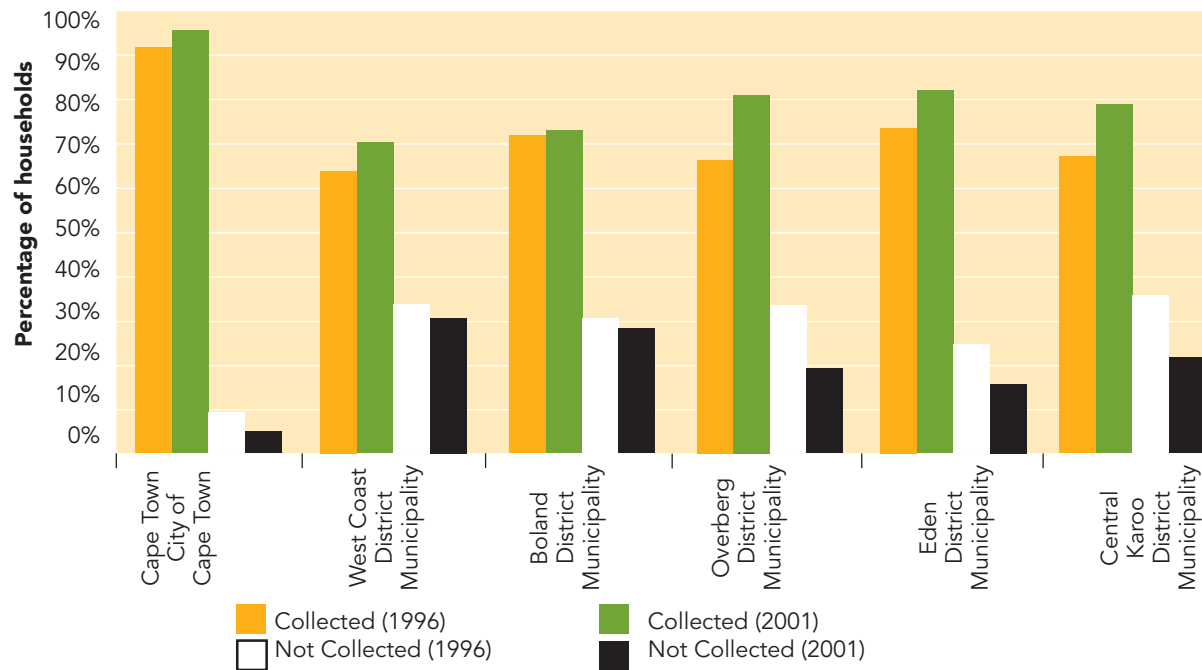


Figure 8.2: Waste Removal: Collected vs Not-collected services in the Western Cape (Source: Stats SA, Census 1996 and 2001)

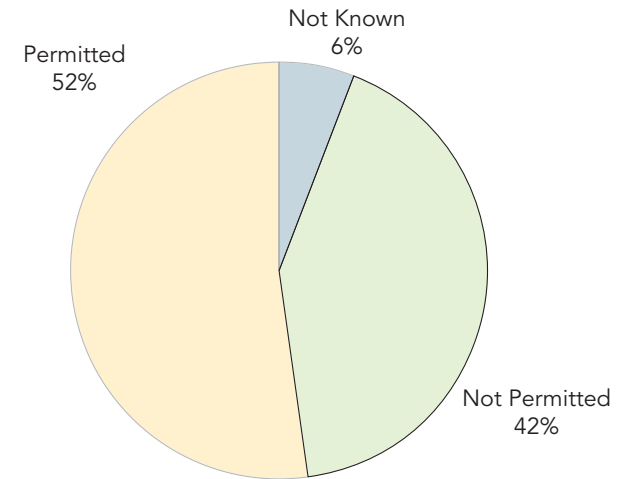


Figure 8.3: Permit status of landfills in the Western Cape (Source: D:EA&DP, 2004)

in selecting waste disposal sites since this is a particularly contentious issue. There are 71 landfills in the Western Cape. The target set by the province indicates that by the end of 2005 these landfills should be permitted or registered. This process will help to ensure environmental standards are adhered to and maintained. Figure 8.3, shows the current permit status of these landfills. Currently only 52% of the landfills in the Western Cape are permitted.

A number of existing landfills are planned for closure in the near future which will exacerbate the current airspace shortage problem. The strategy of the City of Cape Town is to develop a new single regional, permitted landfill facility to replace existing landfills due for closure, in addition to the implementation of a number of IWM strategies, as described in the City of Cape Town IWMP.

IMPACTS

The impacts of insufficient and inappropriate waste management are:

- Disease and injury can result from poorly managed and inefficient waste management services.
- Illegal dumping results from erratic or insufficient waste collection and can cause pollution of the environment and the spread of disease.
- Financial and human resources are impacted on by crisis management requirements (e.g. area cleaning).
- Pollution of the environment results from poorly managed facilities and illegal dumping.
- Contamination of sewage sludge with heavy metals and other industrial waste, making it unsuitable for certain disposal options.

ISSUE: SANITATION AND THE PROVISION OF ASSOCIATED SERVICES

Sewage is the main constituent of liquid waste generated. Managing sewage collection, treatment and discharge is a critical issue and several challenges face the authorities in this regard. Amongst these are:

- the high costs of collection/treatment services;
- ensuring outfall water quality complies with legislation;
- managing grey-water outfall;
- servicing informal housing areas; and
- ensuring sewage sludge disposal complies with regulations.

STATE

Percentage of Sanitation Services by Type

Figure 8.4 compares sanitation services provided in the Western Cape between 1996 and 2001. Consistently, the

percentage of flush or chemical toilets provided has increased except in the City of Cape Town. However, the actual number of households serviced with flush or chemical toilets increased from 583 044 in 1996 to 664 202 in 2001 (Census 1996 and 2001) in Cape Town.

Pit and bucket latrines have reduced consistently in all of the District Councils. Nevertheless, the percentage of households with no sanitation services has increased consistently between 1996 and 2001, possibly explained by increased urbanisation and more accurate census data.

IMPACTS

There are several possible impacts relating to sanitation service shortfalls. These are:

- An inability to maintain pace with an expanding population increases the risk of pollution.
- The costs of corrective action responses (rehabilitation/health costs) related to pollution are high.
- Delaying improvements in service provision results in the problem becoming increasingly difficult and costly to redress.
- Lack of sanitation services or poor sanitation services leads to the spread of disease, such as diarrhoea.

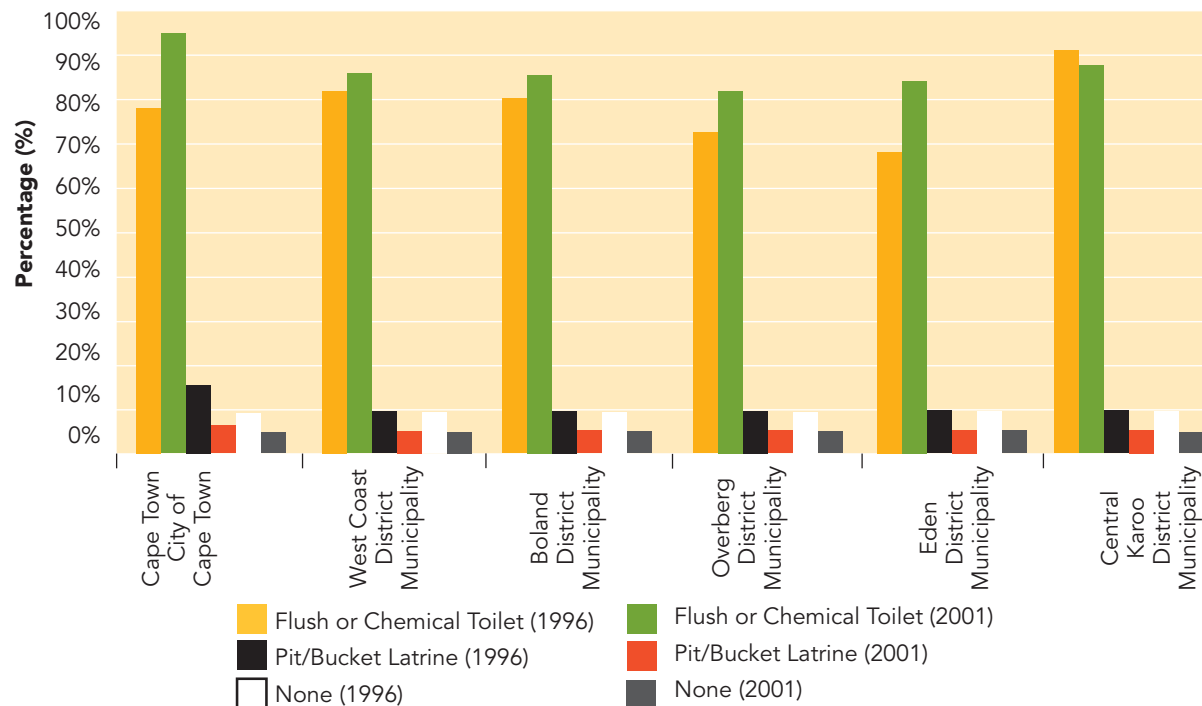


Figure 8.4: Sanitation Service Provision in the Western Cape (Source: Stats SA, Census 1996 and 2001)



Summary and Status of Indicators used in this Chapter

Waste Indicators	How we are doing?	Comments
Amount of waste generated per annum	? 😐	Although accurate data is not available, trends indicate an increase in waste generation
Percentage of hazardous waste generated	😐	The Western Cape contributes only 3% to SA hazardous waste stream, but the amount of waste being generated is increasing.
Percentage of collected and non-collected waste	😊	Only 52% of the province's landfills are permitted. Not trend data is currently available.
Percentage of landfills permitted	😐	Only 52% of the province's landfills are permitted. Not trend data is currently available.
Percentage of sanitation services per type	😊	Sanitation services and the provision of flush toilets have improved.

Indicators Suggested For Future Monitoring

It is recommended that the following data be monitored for inclusion in future SoER reports for the Western Cape:

- Percentage waste recycled.
- It is also suggested that waste generation be more accurately and consistently monitored.

RESPONSES

The table below summarises some of the legislation and other initiatives that have been implemented in response to the waste and sanitation issues discussed opposite:



International	<ul style="list-style-type: none"> • Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and their Disposal, 1989 • Fourth ACP-EEC Convention, 1989 • Bamako Convention on the Ban of the Import and Control of Transboundary Movement of Hazardous Wastes within Africa (1991) • Convention of Prior Informed Consent, 1998
National	<ul style="list-style-type: none"> • South African Constitution, 1996 • National Environmental Management: Waste Management Bill, 2000 • Environmental Conservation Act 73 of 1989 • National Water Act 36 of 1998 • Hazardous Substances Act 15 of 1973 • Fertilizers, Farm Feeds and Agricultural Remedies Act 36 of 1947 • National Waste Management strategy; • Minimum Requirements for Waste Disposal by Landfill, 1998 • Polokwane Declaration 2001;
Provincial	<ul style="list-style-type: none"> • Various Recycling and cleaner production initiatives • IWMPs for District Councils (current) • Drafting of the Health Care Waste Management Act and Regulations • Development of the Integrated Pollutant and Waste Information System • Development of a Provincial Hazardous Waste Management Plan
Other (local)	<ul style="list-style-type: none"> • Extension of service delivery; • Development of IWMPs for IDPs; • Local Recycling Incentives (62% increase in the number of recycling operations since 1999 in CMA); • Local garden refuse centres; • Landfill licensing goals;



LINKS

Waste management links to the following theme chapters:

Health – poor sanitation and waste disposal services leads to the spread of diseases such as cholera and diarrhoea.

Biodiversity – pollution resulting from poor waste management has a negative impact on biodiversity.

Inland water and supply – pollution from poor sanitation, grey water and poorly managed landfill sites leads to a reduction in water quality (surface and ground water).

Urban development – the location of landfill sites is a controversial issue and has implications for urban development.

Economic Development – economic development has implications for the increased generation of waste.

CONCLUSION

Levels of waste removal service provision in the Western Cape appear to be improving despite high population growth. Approximately 89% of the population has access to solid waste collection and 80% of the population has access to sanitation services and service delivery continues to improve. However, the increasing cost of providing waste management services, shortages in the air space available for landfills and the increasing amount of waste being generated are all issues that need to be addressed by the province.

Currently no waste generation or waste disposal reduction goals have been set in the province. These targets need to be established and effective monitoring implemented if the province is to start to make progress in significantly reducing waste going to landfill sites. Under the auspices of the National Waste Management Strategy 66% of the municipalities in the Western Cape are currently developing Integrated Waste Management Plans (IWMPs). These will outline plans to reduce the amount of waste that needs to be disposed of, by placing emphasis on reducing and recycling waste. Currently only the CMA has developed an IWMP.

NOTES ON DATA

- In South Africa, average unit generation rates and population statistics are used to calculate waste quantities. Information derived from this method is unreliable as unit generation rates vary amongst income groups, although it does reflect waste generation trends. No accurate data currently exists concerning the amount of waste being re-cycled or the number of waste re-cycling facilities, at a provincial level. This data is essential for monitoring the success of IWM strategies.