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Vuthela
ILEMBE LED PROGRAMME

MANDENI
LOCAL
MUNICIPALITY

MANDENI LOCAL MUNICIPALITY

INTEGRATED WASTE MANAGEMENT PLAN FINAL DRAFT

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Version 1

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Contents

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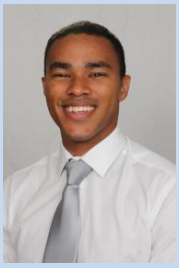
Contact Person 	Ian Malloy Environmental Scientist
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Acronyms and Abbreviations

AMP	Asset Management Plan
APPA	Atmospheric Pollution Prevention Act.
ASP	Africa Stockpiles Programme.
DEA	Department of Environmental Affairs.
DM	District Municipality.
DO	Department of Health.
DoE	Department of Education.
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation (formerly Department of Water Affairs (DWA).
DPW	Department of Public Works.
ECA	Environment Conservation Act (73 of 1989).
ECDC	Eastern Cape Development Corporation.
ECIC	Eastern Cape Implementation Committee.
ECSECC	Eastern Cape Socio-Economic Consultative Council.
EDTEA	Department: Economic Development, Tourism, and Environmental Affairs
EIA	Environmental Impact Assessment.
EPWP	Expanded Public Works Programme
eWASA	e-Waste Association of South Africa.
FBRR	Free Basic Refuse Removal.
GDPR	Gross Domestic Product per Region.
HCRW	Health Care Risk Waste.
HCW	Health Care Waste.
HWMP	Hazardous Waste Management Plan.
iDM	iLembe District Municipality
IDP	Integrated Development Plan.
IDZ	Industrial Development Zone.
IEM	Integrated Environmental Management.
IPWM	Integrated Pollution and Waste Management.
IRD	Initial Rate of Deposition
IT	Information Technology.
IWM	Integrated Waste Management.
IWMP	Integrated Waste Management Plan.
IWMSA	Institute of Waste Management South Africa.
KLM	KwaDukuza Local Municipality
LAs	Local Authorities (Local and District level authorities).
LM	Local Municipality.
MEC	Member of Executive Council.
MIIU	Municipal Infrastructure Investment Unit.
MLM	Mandeni Local Municipality.
MRF	Material Recovery Facility.
NEMA	National Environmental Management Act.
NEMWA	National Environmental Management: Waste Act (59 of 2008).
NGL	Natural ground level
NHA	National Health Act (61 of 2003).
NWMS	National Waste Management Strategy.
OHSA	Occupational Health and Safety Act (85 of 1993).
PCBs	Polychlorinated Biphenyls.
PE-HD	Polyethylene high density.
PE-LD-	Polyethylene low density.
PET	Polyethylene Terephthalate.
PIWMP	Provincial Integrated Waste Management Plan.
POP(s)	Persistent Organic Pollutant(s).
PP	Polypropylene.
PS	Polystyrene.
PSC	Project Steering Committee.
PUDSS	Permissible Utilisation and Disposal of Sewage Sludge.
PVC	Polyvinyl Chloride.
RDP	Reconstruction and Development Programme.
ROSE	Recycling Oil Saves the Environment.
RSA	Republic of South Africa.

SABS	South African Bureau of Standards.
SANBI	South African National Biodiversity Institute.
SATRP	South African Tyre Recycling Process Company.
SAWIC	South African Waste Information Centre.
SIDA	Swedish International Development Corporation Agency.
TCs	Traditional Councils
UN	United Nations.
WHO	World Health Organisation.
WIS	Waste Information System.
WMO(s)	Waste Management Officer(s).
WRC	Water Resource Commission.
WWTW	Waste Water Treatment Works.

Definitions

Basic refuse removal	A baseline service level as established under Clause 9.1 of the National Policy of Basic Refuse Removal to indigent Households.
Best Practicable Environmental Option	The outcome of a systematic and consultative decision-making procedure. The option that provides the most benefit and the least damage to the environment (across air, water and land) as a whole, at acceptable cost, in the long term as well as in the short term. (NEMWA, 2008).
Best Practice	Process, technique, or innovative use of technology, equipment or resources that has a proven record of success in providing significant improvement in cost, schedule, quality, performance, safety, environment, or other measurable factors which impact on an organisation.
Bioremediation	Process whereby natural organisms (e.g., bacteria, fungi or plants) or enzymes are used to degrade contaminants.
Building and demolition wastes	Waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition, which include: discarded concrete, bricks, tiles and ceramics; discarded wood, glass and plastic; discarded metals; discarded soil, stones and dredging spoil; other discarded building and demolition wastes (NEMWA Amendment Act, 2014).
Business waste	Waste that emanates from premises that are used wholly or mainly for commercial, retail, wholesale, entertainment or government administration purposes (includes general and hazardous wastes) (NEMWA Amendment Act, 2014).
Buy-back centre	A centre where people sell recyclable material they have collected. Recycling companies buy recyclable materials from the buy-back centres and pay only for the materials they can use. (Draft Municipal Waste Sector Plan, 2011).
By-law	Legislation passed by the council of a municipality binding in the municipality on the persons to whom it applies (Municipal Systems Act, 2000).
Carcinogen	A Chemical substance or mixture of chemical substances which induce cancer or increase its incidence when inhaled, ingested or absorbed through the skin (SANS 10234, 2007).
Clean Production	The continuous application of integrated preventative environmental strategies to process, products and services to increase overall efficiency and to reduce the impact of such processes, procedures and services on health and the environment (NEMWA, 2008).
Composting Facility	Facility for the aerobic decomposition of biodegradable organic matter to produce compost (Draft Municipal Waste Sector Plan, 2011).
Disposal	The burial, deposit, discharge, abandoning, dumping, placing or release of ant waste into, or onto any land (NEMWA, 2008).
Domestic waste	Waste excluding hazardous waste that emanates from premises that are used wholly or mainly for residential, educational health care, sports or recreation purposes which include: garden and park wastes, municipal waste, food waste (NEMWA Amendment Act, 2014).
Drop-off centre	A facility where the public is able to drop off garden refuse, recyclables and bulky waste.
Duty-of-care principle	Any person handling or managing hazardous substances or related equipment is ethically responsible for applying the utmost care.
Environment	The surroundings within which humans exist and that are made up of- (i) the land, water and atmosphere of the earth

	(ii) micro-organisms, plant and animal life (iii) any part of combination of (i) and (ii) and the interrelationships among and between them: and (iv) the physical, chemical, aesthetic and culture properties and conditions of the foregoing that influence human health and well-being: (NEMA, 1998)
General waste	Waste that does not pose an immediate hazard or threat to health or to the environment, and includes— *(a)* domestic waste; *(b)* building and demolition waste; *(c)* business waste: and *(d)* inert waste. (NEMWA, 2008)
Hazardous waste	Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.(NEMWA, 2008)
Incineration	Any method, technique or process to convert waste to flue gases and residues by means of oxidation (NEMWA, 2008).
Industry	Includes commercial activities, commercial agricultural activities, mining activities and the operation of power stations; (NEMWA, 2008)
Inert waste	Waste that *(a)* does not undergo any significant physical, chemical or biological transformation after disposed *(b)* does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which they may come into contact and *(c)* does not impact negatively on the environment, because of its pollutant content and because of the toxicity of its leachate is insignificant (NEMWA, 2008)
Landfill	Site for the controlled disposal of waste materials.
Mandeni Local Municipality (MLM)	The local authority administrating the study area.
Minimisation	When used in relation to waste, means the avoidance of the amount and toxicity of waste that is generated and, in the event where waste is generated the reduction of the amount and toxicity of waste that is disposed of (NEMWA, 2008)
Minimum Requirements	Refers to the Minimum Requirements series of documents relating to the handling, classification, treatment and disposal of general and hazardous waste, first published by DWAF in 1998. These have largely been replaced by various waste-related Norms and Standards.
Materials Recovery Facility (MRF)	A facility where waste is temporarily stored and ideally sorted, before it is transported more economically to either recycling centres or landfills (Draft Municipal Waste Sector Plan, 2011)
Policy	Provides guidance for legislation and administration. Does not refer to the development of implementation plans; does not refer to operational issues; does not define roles and responsibilities.
Polluter Pays Principle	The Polluter Pays Principle is a principle in international environmental law where the polluting party pays for the damage done to the natural environment.
Precautionary Principle	The precautionary principle permits a lower level of proof of harm to be used in policy-making whenever the consequences of waiting for higher levels of proof may be very costly and/or irreversible: Where a risk is unknown; the assumption of the worst case situation and the making of a provision for such a situation; and Principle adopted by the United Nations Conference on the Environment and Development (1992) that, in order to protect the environment, a precautionary approach should be widely applied, meaning that where there are threats of serious or irreversible damage to the environment, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.
Recovery	The controlled extraction or retrieval of any substance, material or object from waste (NEMWA Amendment Act, 2014).
Recycle	The process where waste is reclaimed for further use, which process involves the separation of waste from a waste stream for further use and the processing of that separated material as a product or raw material (NEMWA, 2008).

Recycling Point	A facility where the public can drop off recyclables, no money is paid for the recyclables. Recycling points are usually found at schools, libraries and vehicle service stations. These facilities are owned by the private sector.
Re-use	To utilise the whole, a portion of or a specific part of any substance, material or object from the waste stream for a similar or different purpose without changing the form or properties of such substance, material or object (NEMWA Amendment Act, 2014).
Sharps	Items such as needles, syringes, and blades of clinical glass that is capable of causing cuts, abrasions or puncture wounds (Draft National Norms and Standards for the Storage of Waste, 2011).
Sustainable Development	The integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations (NEMA, 1998).
Transfer stations	A facility where waste is temporarily stored and ideally sorted before it is transported more economically to either recycling centres or landfills (Draft Municipal Waste Sector Plan, 2011).
Treatment	Any method, technique or process that is designed to *(a)* change the physical, biological or chemical character or composition of a waste; or *(b)* remove, separate, concentrate or recover a hazardous or toxic component of a waste; or *(c)* destroy or reduce the toxicity of a waste in order to minimise the impact of the waste on the environment prior to further use of disposal (NEMWA, 2008).
Waste	(a) any substance, material or object, that is unwanted, rejected, abandoned, rejected, discarded, or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or (b) any substance, material or object that is not included in Schedule 3 that may be defined as a waste by Minister by notice in the Gazette. but any waste or portion of waste, referred to in paragraphs (a) and (b) ceases to be a waste- (i) once an application for its re-use, recycling or recovery has been approved, or after such approval, once it is, or has been re-used, recycled or recovered; (ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered. (iii) where the Minister has, in terms of section 74, exempted any waste or portion of waste generated by a particular process from the definition of waste; or (iv) where the Minister has, in the prescribed manner, excluded any waste stream or portion of a waste stream from the definition of waste.
Waste Avoidance	Preventing waste generation altogether (i.e. zero waste generation).
Waste Co-operative	An enterprise jointly owned and managed by its employees, which provides waste-related services (e.g. litter-picking, street sweeping) to the communities as per contract with an authority. They are envisioned to bring about an improved feeling of ownership and responsibility in communities and generate entrepreneurship in previously disadvantaged communities.
Waste disposal facility	Any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premise (NEMWA, 2008).
Waste Exchange	The activity that takes place when waste is exchanged between companies, individuals or organisations, in order for it to be of mutual benefit to both parties. Waste from one could even be raw materials for the other.
Waste Generation	The weight or volume of materials and products that enter any given waste stream before recycling, composting, land filling or combustion takes place. Can also represent the amount of waste generated by a given source or category of sources.
Waste Management Hierarchy	The Waste Management Hierarchy reflects the different waste management options, from reduction (more preferred) though to re-use, recycling, recovery, treatment/destruction, and lastly disposal (least preferred), that should all form part of an integrated waste management system (NEMA, 2008).
Waste Information System	A computerised database containing information about waste management organisations and agencies, as directed to be established as part of the implementation of the National Waste Management Strategy of South Africa.
Waste Management Licence	A license issued in terms of section 49 of the National Environmental Management, Waste Act 2009 (NEMWA, 2008).

Waste Management Officer	A waste management control officer designated in terms of section 10 (NEMWA, 2008).
Waste Management Services	Waste collection, treatment, recycling and disposal services (NEMWA, 2008).
Waste Reuse / Recovery	The recovery or reapplication of a package or product for uses similar or identical to its originally intended application, without manufacturing or preparation processes that significantly alter the original package or product. Recovery can also refer to the recovery of energy from waste.
Waste Stream	The total flow of waste falling under a particular waste category from activity areas, businesses units, and operations that is recovered, recycled, reused, or disposed of in landfills e.g. domestic waste.
Waste Transfer Facility	A facility that is used to accumulate and temporarily store waste before it is transported to a recycling, treatment or waste disposal facility (NEMWA, 2008).
Waste Transporter	A company or individual that provides a commercial service as a transporter of waste, must be registered on the Municipality's Waste Transporter System.
Waste Treatment Facility	Any site that is used to accumulate waste for the purpose of storage, recovery, treatment, reprocessing, recycling or sorting of that waste

The definitions used in this report are taken from a number of sources:

- South African National Standard (SANS) (2007) Globally Harmonized System of Classification and labelling of Chemicals (GHS)
- DEAT. (2009). National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) National Domestic Waste Collection Standards
- National Environmental Management Act No 62 of 2008
- Local Government: Municipal Systems Act, 2000
- DEA (2012) Municipal Waste Sector Plan GN 270 of 2012
- National Environmental Management: Waste Act 59 of 2008: National Norms and Standards for the Storage of Waste (GN 926 of 2013).
- National Environmental Management: Waste Amendment Act (Act No, 26 of 2014).

1 INTRODUCTION

1.1 Background

The Mandeni Local Municipality (MLM) is a Category B municipality situated within the iLembe District of the Kwa-Zulu Natal Province. The MLM is located on the east coast of the Kwa-Zulu Natal province and shares borders with the Kwadukuza Local Municipality to the south and the uMlalazi Local Municipality to the west and north. The MLM has a total population of 147 808 people residing in 38 233 households spread unevenly over 18 electoral wards. The municipal area covers approximately 545.5 km^2 and is predominantly rural in nature. The Ingonyama Trust land accounts for the majority of its land area, and is occupied by the members of the Sikhonyane, Mathonsi and Macambini Traditional Councils (TCs). As such, the majority of the population reside within traditional rural settlements spread randomly within the municipal area. Agricultural land, the majority of which is sugar-cane farms, accounts for at least one-third of the land within the municipality (Isibuko Se Africa, March 2017). Agriculture is the main employment sector in the municipal area and thereafter manufacturing, elementary work, plant and machine work are the highest non-farming categories. Sugar-cane farming is the main form of commercial agriculture, however, the manufacturing sector is the largest contributor to the Mandeni GDP followed by the agriculture industry (Statistics South Africa, 2011).

The MLM is responsible for the provision of a number of waste management services to the communities within its area of jurisdiction. These services include the collection and safe disposal of domestic and commercial waste. The MLM is required to develop an integrated waste management plan (IWMP) as per the requirements of the National Environmental Management Waste Act (59 of 2008) as amended (hereafter referred to as the Waste Act) to sustain and improve waste management in the MLM. This IWMP is a revision of the 2015 IWMP and is intended to be used to guide municipal waste management activities from 2019 – 2024.

1.1.1 Why Undertake an IWMP?

In terms of Section 11(4) (a) of the Waste Act, all provincial and local authorities are required to compile an IWMP, submit it to the MEC for endorsement, and include it in the local authority's IDP.

1.2 A Definition of Waste

The National Environmental Management: Waste Amendment Act (Act No, 26 of 2014) defines waste as follows:

"waste" means –

(a) any substance, material or object, that is unwanted, rejected, abandoned, rejected, discarded, or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or

(b) any substance, material or object that is not included in Schedule 3 that may be defined as a waste by Minister by notice in the Gazette.

but any waste or portion of waste, referred to in paragraphs (a) and (b) ceases to be a waste-

(i) once an application for its re-use, recycling or recovery has been approved, or after such approval, once it is, or has been re-used, recycled or recovered;

(ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered.

(iii) where the Minister has, in terms of section 74, exempted any waste or portion of waste generated by a particular process from the definition of waste; or

(iv) where the Minister has, in the prescribed manner, excluded any waste stream or portion of a waste stream from the definition of waste.

1.3 Contents of an IWMP

The Waste Act outlines the requirements for an IWMP. These requirements have been included in the table below along with a description of how this requirement has been met and details of where in this report that relevant information is located.

Table 1: The Waste Act Requirements for an Integrated Waste Management Plan

Waste Act section no.	Requirement	Comments	Section in the IWMP
12(1)(a)	Contain a situation analysis that includes-		
12(1)(a)(i)	A description of the population and development profiles of the area to which the plan related	None	Section 3.1.1
12(1)(a)(ii)	An assessment of the quantities and types of waste that are generated in the area	None	Section 3.4 and 3.5
12(1)(a)(iii)	A description of the services that are provided , or that are available for the collection, minimisation, re-use, recycling and recovery, treatment and disposal of waste	None	Section 3.6 and 3.7
12(1)(a)(iv)	The number of persons in the area who are not receiving waste collection services	None	Section 3.1.1.h

Waste Act section no.	Requirement	Comments	Section in the IWMP
12(1)(b)	Within the domain of the municipality, set out how that municipality intends to:		
12(1)(b)(i)	To give effect, in respect of waste management, to chapter 3 of the National Environmental Management Act	None	Section 5 and 6
12(1)(b)(ii)	To give effect to the objectives of this Act	None	Section 5 and 6
12(1)(b)(iii)	To identify and address the negative impacts of poor waste management practise on health and the environment	None	Section 5 and 6
12(1)(b)(iv)	To provide for the implementation of waste minimisation, re-use, recycling and recovery targets and initiatives	None	Section 5.5.4
12(1)(b)(v)	in the case of a municipal IWMP, to address the delivery of waste management services to residential premises	None	Section 5.5.5
12(1)(b)(vi)	To implement the Republic's obligations in respect of relevant international agreements	None	Section 4
12(1)(b)(vii)	To give effect to best environmental practice in respect of waste management	None	Section 4 and 5
12(1)(e)	Establish targets for the collection, minimisation, re-use and recycling of waste	None	Section 5.5.4 and 5.5.5
12(1)(f)	Set out the approach of the municipality for the planning of any new facilities for disposal and decommissioning of existing waste disposal facilities	None	Section 5.5.6
12(1)(g)	Indicate the financial resources required to give effect to the plan	None	Section 5.5.1
12(1)(h)	Describe how the municipality intends to give effect to its IWMP	None	Section 6
12(1)(i)	Comply with requirements prescribed by the Minister	The IWMP has been developed in compliance with the Waste Act.	

1.4 IWMP History in Mandeni Local Municipality

The first IWMP undertaken for the MLM was in 2009 (Arcuss GIBB, 2009) and covered the period from 2009 – 2014. The second IWMP (review of the first IWMP) for the MLM was undertaken in 2014 and 2015, submitted to the MLM in May 2015 and covered a period from 2015 – 2019 (GIBB, May 2015).

1.5 Timeframes and Approval of this IWMP

This IWMP is intended to inform the revision of the IDP however the 2017-2022 MLM IDP has already been developed. This IDP does address gaps in waste management and proposed solutions to address these gaps. While the IDP gives timeframes for waste management initiatives, these timeframes are generally unrealistic and thus the implementation plan of this IWMP has not been aligned with the timeframes given in the IDP. The waste management initiatives given in the IDP have been incorporated into the IWMP as far as possible. It is the intention for this IWMP to be finalised and adopted by council by 2019. Thereafter the IWMP should be submitted to the MEC for endorsement.

(a) Integrated Waste Management Plans

All municipalities must submit an IWMP to the MEC for endorsement. The municipality is also responsible for incorporating the IWMP into its IDP. Annual performance reports must be prepared in terms of section 46 of the Municipal Systems Act (32 of 2000) and must contain information on the implement of the municipal IWMP.

In terms of section 75(1) of the Municipal Systems Act, a municipality must give effect to the provisions of the Constitution and must:

- Give priority to the basic needs of the local community.
- Promote the development of the local community.
- Ensure that all members of the local community have access to at least the minimum level of available resources and the improvement of standards of quality over time.

1.6 Integrated Waste Management Planning and IWMPs

The “integrated” aspect of Integrated Waste Management Planning means that all aspects of waste management are considered, from waste generation to reduction, recycling, treatment and finally disposal. This approach is illustrated in *Figure 1* which shows the “waste hierarchy” as defined in the National Waste Management Strategy (DEA, 2011) (NWMS). This diagram illustrates that the majority of waste should be addressed via the lower tier activities (waste avoidance and reduction, re-use, recycling and recovery), and how disposal should be applied as a last resort. It gives a clear illustration of the best environmental practice concerning waste management and aims to reduce the production of waste and to divert resources away from landfill sites where possible.

The NWMS states that the primary objective of integrated waste management planning is to: “integrate and optimize waste management so that the efficiency of the waste management system is maximised and the impacts and financial costs associated with waste management are minimised, thereby improving the quality of life of all South Africans.”

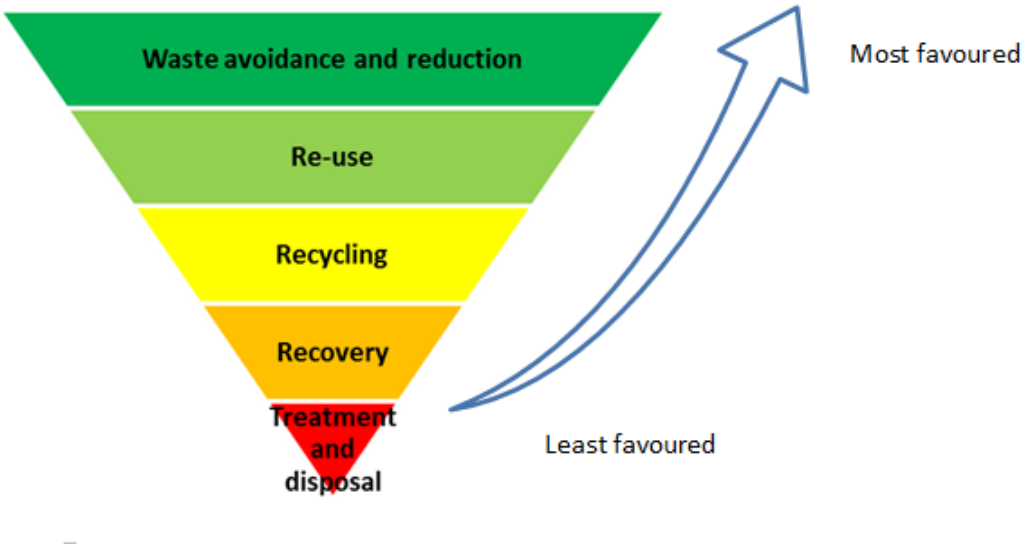


Figure 1: The waste hierarchy as per the National Waste Management Strategy (DEA, 2011)

An IWMP is a plan which defines the vision, objectives and targets for the provision of waste management services. They are compiled by provincial and local authorities. IWMPs are typically revised on a five yearly cycle aligned to the review of the Integrated Development Plan (IDP) to ensure the information remains up to date and to accommodate any new development in waste management or legislation. The formulation thereof should include identifying existing gaps in the provision of waste services, identifying objectives and targets, and defining actions and an implementation plan to realize these objectives.

1.7 Integrated Waste Management Plan Development Process

In addition to the Waste Act, two documents were considered when developing this IWMP. The first is the Department of Environmental Affairs (DEA) Guideline for the Development of Integrated Waste Management Plans (IWMPs). This guideline outlines the planning process presented in the figure below.

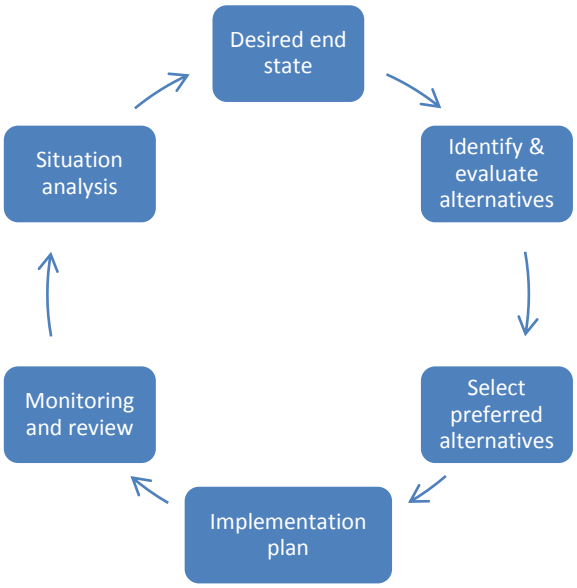


Figure 2: IWMP planning phases as per the Guidelines for the Development of Integrated Waste Management Plans (DEA).

1.8 Scope

This IWMP has been produced for MLM and is applicable geographically to all areas falling within the jurisdiction of MLM. As a municipal plan, it is applicable to all directorates of MLM.

The update of the MLM IWMP is part of a broader appointment that also includes the update of the KwaDukuza Local Municipality (KLM) IWMP and the update of the iLembe District Municipality (iDM) IWMP as well as a scoping investigation of a regional landfill for the District Municipality. This report, however, focuses exclusively on integrated waste management planning in MLM. The updated MLM, KLM and iDM IWMPs and scoping investigation report for a regional landfill are contained in four separate documents.

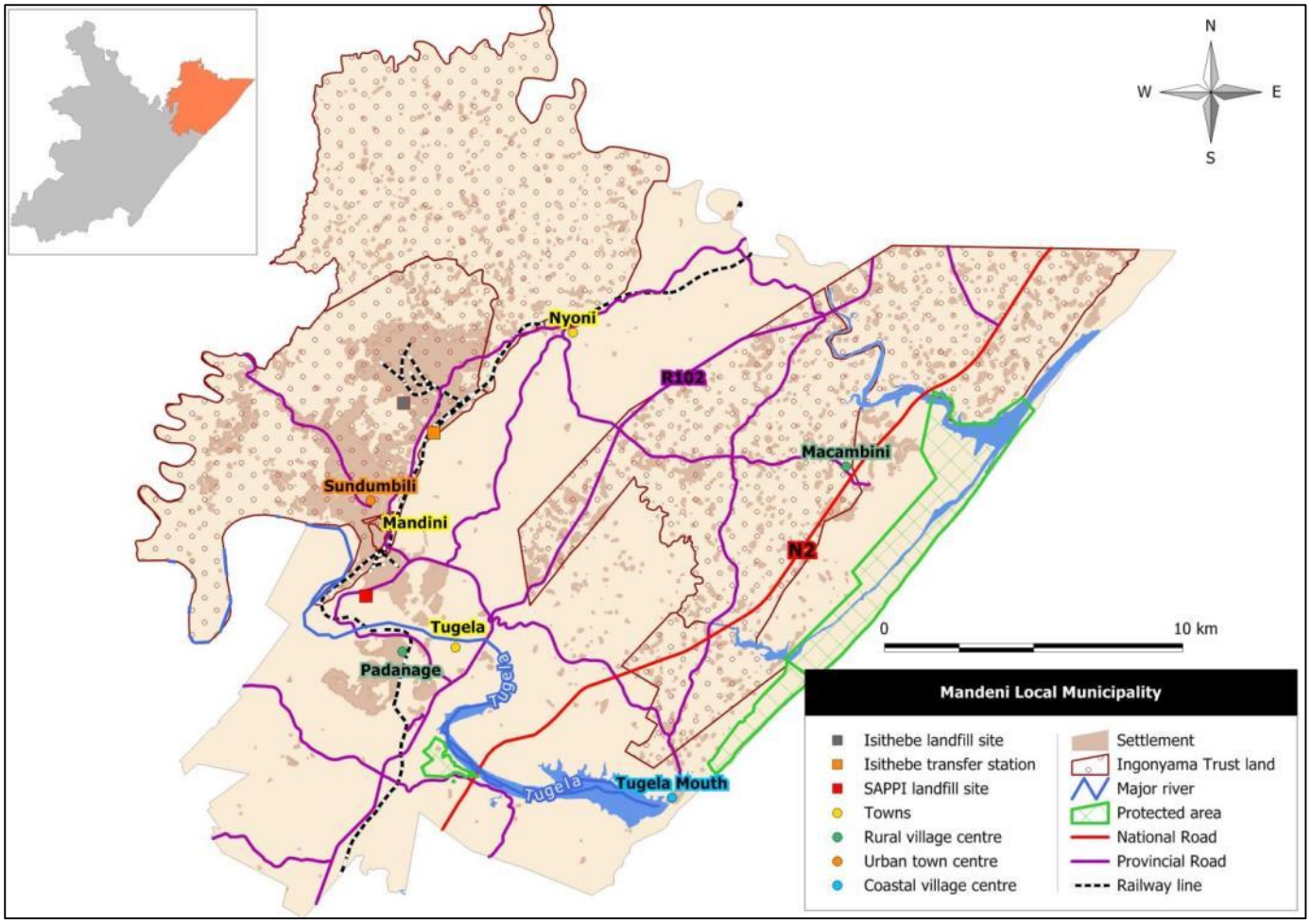


Figure 3: The jurisdictional area and waste infrastructure of the Mandeni Local Municipality and its main towns

1.9 Context of Roles and Responsibilities

National waste legislation, policy and guidelines place specific responsibilities onto local authorities. The Waste Act requires local authorities to implement mechanisms for the provision of waste collection services including collection, storage and disposal. Local authorities are also required to facilitate recycling and waste diversion from landfill and manage waste information appropriately.

1.9.1 National Government

National government is tasked with establishing a national waste management strategy, including norms, standards and targets. National norms and standards may cover all aspects of the waste value chain, from planning to service delivery.

1.9.2 Provincial Government

Provincial governments are tasked with the implementation of the national waste management strategy and national norms and standards, and may set additional, complementary provincial norms and standards. The Waste Act notes that these norms and standards must amongst other things facilitate and advance regionalization of waste management services. The Constitution requires Provincial Government to monitor and provide support to municipalities in the province and to promote the development of local government capacity.

1.9.3 Local Government

Local governments are required to ensure the universal and sustainable delivery of services, subject to national and provincial regulation. In particular, they are required to maintain separate financial statements, including a balance sheet of the services provided. The Constitution of South Africa (Department of Justice and Constitutional Development, 1996) and other legislation mandate refuse removal by municipalities in their areas of jurisdiction. The function includes refuse removal, solid waste disposal, street cleaning and recycling. The National Domestic Waste Collection Standards (Department of Environmental Affairs, 2009) require municipalities to provide a weekly collection service to households.

1.9.4 Waste Management Officer

The Waste Act requires that all local municipalities appoint a waste management officer (WMO) from its administration who is responsible for co-ordinating waste management in the municipality.

The responsibilities of the WMO of a local municipality are defined in the National Waste Management Strategy (Department of Environmental Affairs, November 2011)as:

- Manage stakeholders in Waste Act implementation.
- Liaise with EMI compliance monitoring activities in the municipality.
- Municipal IWMP: planning and reporting cycles.
- Build capacity in relation to Waste Act implementation.
- Monitor adherence to norms and standards in the delivery of waste services.

The DEA's Guideline for designation of WMOs (DEA, not dated) further expands on the role of the WMO for local municipalities.

1.10 Alignment with other Strategic Plans

There are a number of strategic plans on a national, provincial and local level which have been taken into consideration during the developing this IWMP. A summary of these is provided in this section below.

1.10.1 Alignment with National Strategic Plans

(a) National Environmental Management: Waste Act 59 of 2008 (hereafter referred to as the Waste Act), as amended

The Waste Act is South Africa's core waste legislation, and was promulgated 01 July 2009. The act covers a wide spectrum of issues including requirements for a National Waste Management Strategy (Department of Environmental Affairs, November 2011), IWMPs, definition of priority wastes, waste minimisation, treatment and disposal of waste, Industry Waste Management Plans, licensing of activities, waste information management, as well as addressing contaminated land. A number of regulations have been promulgated under the Waste Act. The waste act was amended in 2014. The implications of applicable waste management legislation have been considered in the 'Needs Analysis' section of this report.

(b) National Waste Management Strategy

The first National Waste Management Strategy (NWMS) (Department of Environmental Affairs, November 2011) was published in 1999. It was the first strategy to address South Africa's waste management challenges. The strategy effectively defines South Africa's vision for waste management highlighting themes such as "cradle to grave" management of waste products and the waste management hierarchy which encourages waste disposal only as a last resort.

The NWMS was revised in 2011 in line with Chapter 2, Part 1, of the Act which requires the establishment of a NWMS within two years of the Act coming into effect. Significant changes include the addition of "remediation" to the waste management hierarchy, and the consolidation of what was previously many different action plans into a single action plan. The targets of the NWMS (2011) are considered in the 'Waste Objectives and Targets' section of this report.

The NWMS is currently under review. It is anticipated that the revised NWMS will only be finalised after the review of this IWMP is complete. This IWMP is therefore aligned with the targets of the 2011 NWMS as well as the draft goals of the 2018 NWMS.

Table 2: National Waste Management Strategy Objectives

Goal	Targets for 2016
Promote waste minimisation, re-use, recycling and recovery of waste.	25% of recyclables diverted from landfill sites for re-use, recycling or recovery All metropolitan municipalities, secondary municipalities, and large towns have initiated separation at source programmes Achievement of waste reduction and recycling targets as set in industry waste management plans for paper and packaging, pesticides, lighting (CFLs) and tyre industries
Ensure the effective and efficient delivery of waste services.	95% of urban households and 75% of rural households have access to adequate levels of waste collection services 80% of waste disposal sites have permits
Grow the contribution of the waste sector to the green economy.	69,000 new jobs created in the waste sector 2,600 additional SMEs and cooperatives participating in waste service delivery and recycling
Ensure people are aware of the impact of waste on their health, well-being and the environment.	80% of municipalities running local awareness campaigns 80% of schools implementing waste awareness campaigns
Achieve integrated waste management planning.	All municipalities have integrated their IWMPs with their IDPs, and have met the targets set in IWMPs All waste management facilities required to report to SAWIS have waste quantification systems that report information to WIS
Ensure sound budgeting and financial management for waste services	All municipalities that provide waste services have conducted full-cost accounting for waste services and have implemented cost reflective tariffs
Provide measures to remediate contaminated land.	Assessment complete for 80% of sites reported to the contaminated land register Remediation plans approved for 50% of confirmed contaminated sites
Establish effective compliance with and enforcement of the Waste Act	50% increase in the number of successful enforcement actions against non-compliant activities 800 environmental management inspectors (EMIs) appointed in the three spheres of government to enforce the Waste Act

(c) Draft National Waste Management Strategy (2018)

As previously mentioned, the DEA is currently revising the 2011 NWMS. The 2018 NWMS has three strategic goals to drive an improvement in waste management in South Africa:

1. Waste minimisation;

2. Effective and sustainable waste services; and

3. Awareness and compliance

These are further unpacked in **Table 3** below.

Table 3: Summary of 2018 NWMS Goals

Goal	Implementation mechanism
1. Prevent waste, and where waste cannot be prevented, divert 50% of waste from landfill within 5 years; 80% within 10 years; and at least 95% of waste within 15 years through reuse, recycling, and recovery and alternative waste treatment.	Waste Prevention: Reduce the generation of waste in the manufacturing sector through cleaner production and industrial symbiosis Prevent food waste by working with agricultural producers, retailers, the hospitality sector and consumers. Waste as a Resource: Divert organic waste from landfill through composting and the recovery of energy Divert construction and demolition waste from landfill through beneficiation Increase recycling and recovery rates Increase technical capacity and innovation for the beneficiation of waste
2. All South Africans live in clean communities with waste services that are well managed and financially sustainable.	Waste Collection: Implementation of the DEA separation at source policy to promote reuse, recycling and recovery of waste Safe and environmentally sustainable disposable of hazardous household wastes. Integrated Waste Management Planning: Provinces provide effective regional guidance and oversight in the development and implementation of metro, district and local municipality IWMPs within the context of overarching Provincial Integrated Waste Management Plans All local authorities to include provisions for recycling drop-off/buy-back/storage centres in their IWMPs by 2020
3. South Africans are aware of waste and a culture of compliance with waste management norms and standards exists, resulting in zero tolerance of pollution, litter and illegal dumping.	Reduction of littering and illegal dumping due to attitudinal shifts and greater public awareness of the environmental damage caused by waste Enhanced capacity to enforce the Waste Act and International Agreements on waste and pollution Municipal landfill sites and waste management facilities comply with licensing standards All local authorities to include provisions for recycling drop-off/buy-back/storage centres in their IWMPs by 2020

(d) Operation Phakisa: Chemicals and Waste Phakisa

Operation Phakisa, an initiative which looks to unlock South Africa's economic potential, sets a number of waste-related national targets. These targets include:

- Reduce industrial waste to landfill by 75%;
- Reduce municipal waste to landfill site by 50%;
- Move towards zero sewage sludge to landfill by 2023;
- Move toward zero meat production waste to landfill by 2023;
- Increase e-waste recycling from 7% to 30%;
- Create 1,000 jobs through recycling and re-use of government computer;
- 50% of households in metropolitan municipalities separating at source by 2023;
- 8,000 direct and indirect jobs through plastic recycling; and
- Produce building aggregates and construction inputs from rubble and glass

(e) National Development Plan

South Africa National Development Plan (NDP) was published in 2012 and outlined the required steps to eliminate poverty and reduce inequality by 2030.

The NDP sets the following objectives related to waste management:

- An absolute reduction in the total volume of waste disposed to landfill site each year through a national recycling strategy;
- Carbon price, building standards, vehicle emission standards and municipal regulations to achieve scale in stimulating renewable energy, waste recycling and retrofitting buildings;
- Consumer awareness initiatives and sufficient recycling infrastructure should result in South Africa becoming a zero waste society; and
- Implement a waste management system through rapid expansion of recycling infrastructure and encouraging composting of organic domestic waste to bolster economic activity in poor urban communities

The NDP also recognises the opportunity for the manufacturing sector to reuse waste.

(f) Back to Basics

The National Department of Cooperative Governance and Traditional Affairs (COGTA) showcased a new strategy at the Presidential Local Government Summit in 2014. The strategy was titled Back to Basics: Serving our Communities Better.

The strategy identified that although progress had been made with regard to service delivery since 1994, more actions were needed to support, educate and, where required, enforce the government mandate for service delivery.

The Back to Basics programme is centred on five pillars:

1. Put people and their concerns first and ensure constant contact with communities through effective public participation platforms;
2. Create conditions for decent living by consistently delivering municipal services to the right quality and standard. This includes planning for and delivery of infrastructure and amenities, maintenance and upkeep, including the budgeting to do this. Ensure no failures in services and where there are, restore services with urgency;
3. Be well governed and demonstrate good governance and administration – cut wastage, spend public funds prudently, hire competent staff and ensure transparency and accountability;
4. Ensure sound financial management and accounting, and prudently manage resources so as to sustainably deliver services and bring development to communities; and
5. Build and maintain sound institutional and administrative capabilities, administered and managed by dedicated skilled personnel at all levels.

The Back to Basics pillars are all applicable to waste management within the municipality.

(g) Municipal Waste Sector Plan (GN 270 of 2012)

This plan, published in March 2012, seeks to address the poor waste management performance of municipalities and to “effectively” address the management of “backlogs” in municipal solid waste service delivery and infrastructure.

1.10.2 Alignment with Provincial Strategic Plans

(a) Provincial IWMP (2012 - 2017), KwaZulu- Natal

The Department of Economic Development, Tourism and Environmental Affairs (EDTEA), the KZN Provincial authority responsible for waste management, drafted an IWMP in 2012, but the plan has yet to be gazetted. While the key focus of the plan addresses provincial performance, it does have implications for local authorities in Kwa-Zulu Natal. The following key waste management challengers with objectives were highlighted:

- A high backlog in domestic waste collection service is experienced in several municipalities. A total of 60% of municipalities in the province are not providing a waste disposal services to more than 75% their population.
    - The KZN province was tasked with developing specific targets for the reduction of waste collection service backlogs for different categories of KZN municipalities within the province and to publish these targets. The establishment of a task was prosed to ensure that these targets are set and achieved.
    - Ensure that all waste transfer and storage facilities meet all the legal requirements, including where necessary a Waste Management License.
    - Ensure that all waste collection and transportation services comply with all the legal requirements.
    - Embark on a programme of guidance and training assistance on rural waste management to rural communities.
- Due to the large percentage of the KZN population residing in rural areas, it will be challenging to provide a waste collection service to these areas that are relatively remote compared to towns and cities. In addition to the long haul distances, the challenge is compounded by poor access, poor road infrastructure and hilly terrain within these rural areas.
- Many general waste landfill sites within the province are operating without a license and are poorly managed.
    - The province, district and local municipalities were to ensure that all waste treatment, processing and disposal facilities were licensed.
    - As many local municipalities lack capacity to follow the procedures for the WML (waste management license) applications, the province was to establish a task team to assist the district and local municipalities in this regard.
    - The EDTEA were to monitor all licensed facilities to ensure that they are operated correctly.
    - All landfill sites were to be registered on the South African Waste Information System (SAWIS system) and waste information was to be recorded and updated regularly.
- Recyclable wastes still end up at landfill sites and are not recycled.
    - The province was tasked with developing, publishing and implementing norms and standards by which all major waste recyclers and waste recycling service providers need to comply with. These waste recyclers and service providers were to register with the

EDTEA and submit information on waste collected or treated for recycling. Another initiative was to ensure that district and local municipality IWMPs report on the measured or estimated quantities of recyclable waste collected and disposed; and set clear, measurable and sufficiently challenging targets for recycling. The district and local IWMPs were to report on recyclable waste generated within the municipal area as a whole and recyclable waste generated through activities associated with municipal service provision and administration.

- The presence of small quantities of hazardous waste such as batteries, medication, poisons (insecticides, herbicides, pest control), paints, solvents, electronic waste (equipment, cartridges) that end up at the landfill sites.
- Several contaminated sites where general waste has been historically disposed or used as infill material were identified, and **a**re producing hazardous leachate and/or landfill gas.
    - The province was tasked with allocating or recruiting sufficient resources and to develop the specialist skills in EDTEA to manage complex procedures, decisions and monitor all the steps in the remediation process. This included developing a register and map with all known contaminated land sites
    - Local municipalities were to inform the EDTEA of contaminated sites or potentially contaminated sites within their municipal area and furnish the EDTEA with any relevant available information thereon. This information was to be included in the IWMPs with remediation status.
- Move integrated waste management within the province forward towards a more sustainable state of affairs.
- Identify and document current problems, issues and gaps in waste management.
- Address waste management issues and gaps systematically and effectively.
- Ensure that the KZN provincial government implements all existing legislation requirements in terms of waste management, most notably the Waste Act.
- Provide a basis for the development, promulgation and/or review of provincial integrated solid waste management regulations that would regulate waste management within the province, as well as serve as a disincentive for poor waste management practices (if necessary).
- Describe the Status Quo of waste management in the context of the province.
- Guide, support and challenge district and local municipalities to implement integrated waste management effectively.
- Guide, challenge and implement incentives for private organisations within the province to implement best practice waste management.
- Define the basis for the introduction, maintaining and promotion of sound recycling initiatives within KZN.
- Promote, encourage and support public involvement and forums in all KZN provincial government related waste strategies and activities.
- Document procedures followed during the development of the IWMP.

1.10.3 Alignment with Regional Strategic Plans

(a) iLembe District Municipality Integrated Development Plan (2017 – 2022)

The current iLembe District Municipality (iDM) IDP covers the period 2017 - 2022. The IDP notes the status of IWMPs and waste collection services in each local municipality in the District. The issues noted in the iLembe District Municipality IDP with regards to waste management are that refuse removal is limited to urban areas and dumping of illegal waste has become a major problem especially in rural areas. It also highlights the standards of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and the importance of complying with the Act. The following actions to improve waste management are proposed:

- The development of the district's IWMP
- Pilot a recycling programme
- Increase people's awareness of the advantages of good waste management practices.
- Develop a public landfill for the district, since the operation of a regional landfill site is the mandate of the District.

The IDP notes that the current waste management initiatives include the EPWP "food for waste" and "recycling", however no details about the budget or programme are given. The only waste management objective set is the adoption of the IWMP by 2019/20.

The targets and implementation plan of this IWMP have been aligned with the District's IDP targets and projects where these are feasible.

(b) Mandeni Municipality Integrated Development Plan (2017 - 2022)

The MLMs Integrated Development Plan (IDP) covers the period 2017 – 2022. The IDP recognises issues associated with waste management in the MLM and provides responses to these issues. The following actions to improve waste management are proposed:

- Reduce the backlog of households mainly in the rural areas that do not have access to basic refuse removal through identifying strategic locations (including dumping hotspots) and placing communal bins (waste skips) in these areas. The IDP notes that the communal bins will be collected weekly to provide a weekly waste collection service.
- Address the illegal dumping problem in the municipal area through awareness campaigns targeted at schools and residents
- Implement monitoring and reporting on the 2015 - 2019 IWMP
- Promoting recycling initiatives
- Acquisition of additional equipment, plant and vehicles to improve the waste collection and disposal

service.

The IDP commits to providing quality and sustainable waste management services to the residents of MLM. The IDP also includes the waste management implementation plan from the 2015 – 2019 IWMP to assist with their planning to deliver an integrated municipal solid waste management service. The procurement of personal protective equipment (PPE) for staff and acquisition of the Isithebe waste transfer station were included as future projects in the IDP.

The targets and implementation plan of this IWMP have been aligned with the IDP targets and projects where these are feasible.

(c) Mandeni Municipality Waste By-Laws and Policy

The first waste management by-laws for the MLM were gazetted in 2010. The by-laws were reviewed and gazetted in 2015 (Mandeni Local Municipality, 2015). The by-laws are comprehensive and outline requirements for:

- Council.
- Occupier of premises that generate domestic or business waste.
- Waste service providers.
- Waste storage containers and container management for general waste
- Routine collection and removal of waste
- Building and demolition waste
- Industrial waste, hazardous waste, health care risk waste and priority waste
- Prohibited disposal and conduct at disposal facilities
- Prohibited littering, dumping, burning of waste and ancillary matters
- Storage, collection, composting and disposal of garden waste
- Offences and penalties.

2 Approach and Methodology

2.1 Legislated Requirements for Integrated Waste Management Plans

The requirements of the National Environmental Management Waste Act (Act 59 of 2008, as amended) (refer to table 1) and the Department of Environmental Affairs (DEA) Guideline for the Development of Integrated Waste Management Plans were used to guide the development of this IWMP.

2.2 Methodology

A phased approach was used to develop the IWMP, as detailed below.

2.2.1 Integrated Waste Management Plan Review

A list of reviewed reports and IWMPs for content are provided below in the section below. Information gathered during the review of these reports and IWMPs were used to inform the MLM IWMP.

2.2.2 Literature Review

An extensive literature review pertaining to waste management in the area was undertaken as part of the situation analysis. This included a review the following documents. A full reference of documents and literature reviewed is represented in the list of references at the end of the report.

- Provincial Profile: KwaZulu-Natal - Community Survey (Statistics South Africa, 2016),
- 2035 KwaZulu-Natal Provincial Growth and Development Strategy, 2016
- KwaZulu-Natal Integrated Waste Management Plan (GIBB, 2012)
- Waste Management: Status Quo Assessment for the iLembe District Municipality (SSI Environmental , February 2012)
- iLembe District Municipality Draft IWMP (2004)
- iLembe District Municipality IDP (2017 - 2022) (iLembe District Municipality, 2017)
- iLembe District Municipality IDP (2018/2019) (annual review) (iLembe District Municipality, 2019)
- iLembe District Municipality Growth and Development Plan (iLembe District Municipality, March 2015)
- Mandeni Local Municipality IDP (2017/2018) (Mandeni Local Municipality, 2017)
- Mandeni Local Municipality IWMP (2015 - 2019) (GIBB, May 2015)

- Mandeni Spatial Development Framework (Final draft, 2017)
- Mandeni Local Municipality Asset Management Plan (IMQS, 2019)
- Final Status Quo and Scoping Assessment Report for the Waste Efficiency Project within the KwaDukuza and Mandeni Municipalities, iLembe District, KZN (Triplo4, April 2019)
- South African Waste Information Centre, (Department of Environmental Affairs, 2018)
- Census data of 2011, Statistics South Africa, (Statistics South Africa, 2011)

2.2.3 Site and Facility Inspections

As part of the appointment for the development of the MLM IWMP, GIBB undertook inspections of private and municipal waste infrastructure, the waste vehicle fleet, sites of interest such as illegal dumpsites, business centres and residential areas. The table below shows details of the facility inspections that were undertaken:

Table 4: Summary of municipal facility site inspections

Site / Facility	Date
Mandeni Municipal offices	22 and 23 August 2018
Mandeni Municipal technical depot	22 August 2018

Table 5: Summary of privately owned facility site inspections

Site / Facility	Date
Sappi Tugela Mill	23 August 2018
iSithebe industrial estate	23 August 2018
Ozone Friendly Recycling	23 August 2018
Premier Waste	23 August 2018
Reclam Mandeni	23 August 2018
Superspar Mandini	23 August 2018
Skyton Recycling Pty Ltd	24 August 2018

2.2.4 Municipal Staff Interviews

Interviews were conducted with municipal staff of the MLM to gain an understanding of the issues they face regarding waste management and areas they feel require improvement. The table below lists those who were interviewed.

Table 6: List of MLM staff interviews conducted

Position within the MLM	Name
Director for Community Services	Mr Zamani Mcineka
Superintendent for Waste	Mr Sikhumbuzo Ndlovu
GIS and Town Planning Manager	Mr Vasi Devan
Revenue manager	Mr Senzo Makoba

2.2.5 Business/ Industry / Social Services Interviews

Representatives from Mandeni-based companies / organisations were interviewed to understand their business operations and key waste management challenges. Details are provided in the table below.

Table 7: List of Business Staff interviews conducted

Business/Company	Name
Waste representative for Sudumbile Hospital	Mrs Divashni Rhana
Sappi Technical Manager	Mr Allen van Zyl
ISisthebe industrial estate tenants manager	Mr Russell Khumalo
Ozone Friendly Recycling	-
Premier Waste	Mr Brandon
Reckam Mandeni	Mr JP
Skyton Recycling Pty Ltd	-
Superspar Mandini: Store Manager	Mr Raja Padayachee

2.2.6 Project Steering Committee

At the project inception meeting the specific organisations/ companies that should form part of the Project Steering Committee (PSC) was confirmed. The table below records the details of the PSC.

Table 8: Details of Project Steering Committee

Organisation / Company	Members	PSC representative
KwaDukuza Local Municipality	Sikhumbuzo Hlongwane, Wilson Mhlongo, Thembeka Mthuli, Mbali Mpanza, Nokubonga Duma	Wilson Mhlongo
Mandeni Local Municipality	Mbongeleni Dlamini, Sikhumbuzo Ndlovu; Dumisani Mbongwa	Mbongeleni Dlamini
iLembe District Municipality	Linda Mncube, Masupha Mathenjwa, Mzuwandile Khuzwayo, Thandeka Thusi, Langalakhe Msomi	Linda Mncube

Organisation / Company	Members	PSC representative
Vuthela iLembe LED Programme	Monja Esterhuizen, Richard Clacey, Megan Iyer	Monja Esterhuizen
UWP Consulting	Monja Esterhuizen, Richard Clacey	Monja Esterhuizen
Kwa-Zulu Natal Department of Economic Development, Tourism and Environmental Affairs	Nomusa Xaba and Heather Sheard	Nomusa Xaba
GIBB (Pty) Ltd - Waste Consultant	Walter Fyvie, Ian Malloy, Anna Taylor, Chad Dustan, Charl Kruger, Kate Flood, Geoff Purnell (Independent specialist consultant to GIBB)	Ian Malloy

2.2.7 Key Stakeholders

At the project inception meeting the specific organisations/ companies that should be Key Stakeholders for this project was confirmed. The table below records the details of the Key Stakeholders.

Table 9: Details of Key Stakeholders

Organisation / Company	Name of Representative Members
Department of Environmental Affairs	Chuma Gushu
Ndwedwe Local Municipality	Nkanyiso Mkhwanazi
Maphumulo Local Municipality	Chris Mhlongo

2.2.8 Presentations and Workshops

The presentations and workshops undertaken to date are indicated in the table below. A list of attendance registers are provided in the appendices.

Table 10: List of presentations and workshops undertaken as part of the IWMP review

Workshop/Presentation	Date
Progress Meeting	12 September 2018
Progress Meeting	27 February 2019
Progress Meeting	22 May 2019
Situational Analysis and Gap and Needs Analysis	1 – 2 July 2019
Draft IWMP with Objectives and Implementation Plan	12 September 2019

2.2.9 Assumptions and Limitations

This situation analysis has drawn information from a number of sources including MLM records and information from MLM staff interviews. It is assumed that the information given verbally in interviews and documented information is accurate.

2.3 Approach to this IWMP

(a) Project Inception

A project inception meeting was held between representatives of GIBB, MLM, KLM, iDM, the Vuthela iLembe LED programme, and DEA on the 20 August 2018 at the iLembe House in Stanger, Kwadukuza. At the project inception meeting, project details including the scope, programme, roles and responsibilities, progress reporting, project risks, information transferal, the project steering committee and key stakeholders, were discussed. The important items raised and agreements made at the meeting were captured in the meeting minutes and the Project Inception Report (24.08.2018).

(b) Situational Analysis

An IWMP, and delivery of services can only be effective if informed by adequate information on the current systems and resources, including human resources available to the municipality. It is important to understand the waste quantities and types being produced in all residential areas, as well as commercial activities in the MLM. Effective planning for waste minimisation and recycling initiatives are dependent on such data. However, little information on waste quantities and waste types was readily available at the time of the compilation of this report. Information on waste management in the MLM gathered by GIBB is summarised and discussed in the sections below.

The Situational Analysis section of this report provides an overview of the present waste management activities undertaken by the municipality. It introduces the biophysical context, demographics of the MLM, discusses its local economy and describes the present waste management services.

3 SITUATION ANALYSIS OF WASTE MANAGEMENT IN MANDENI LOCAL MUNICIPALITY

3.1 Overview Description of Mandeni Municipal Jurisdiction

3.1.1 Demographics

(a) Population Profile

According to Stats SA KwaZulu-Natal Provincial (KZN) Community Survey in 2016 (Statistics South Africa, 2016) the MLM population totalled 147,808 in 2016. Looking at the growth from previous surveys, the population has grown by 1.55% per year over the last 5 years, from 138,078 persons in 2011 to 147,808 persons in 2016 (Statistics South Africa, 2016). Over the last 15 years there has been an approximate 1.0% increase per year in population with a total population of 127,327 recorded in the 2001 census. In 2016, the population of the MLM constituted 22.5% of the population of the iDM and 1.3% of the total population of the KwaZulu-Natal. In 2016, the MLM comprised of 45,678 households that increased from 38,235 in 2011. The trend in average household size in the MLM is decreasing with an average household size of 3.2 people per household in 2016 compared to 3.6 people per household in 2011 (Statistics South Africa, 2016).

Population projections provided in the KZN Community Survey (Statistics South Africa, 2016) estimate an annual growth rate of 1.83% for the iLembe District Municipality, 1.7% for the KwaZulu-Natal province, and 1.6% for South Africa. The population projections for the MLM, iDM, KZN and South Africa are indicated in Table 11.

Table 11: Population projections for Mandeni LM, iLembe DM, KwaZulu-Natal Province and National, 2016 – 2024

Year	Mandeni	iLembe	KwaZulu Natal	National	MLM as % of iDM	MLM as % of province	MLM as % of SA
2016	147,808	657,612	11,065,240	55,653,653	22.5	1.3	0.3
2017	150,099	669,646	11,253,349	55,742,699	22.4	1.3	0.3
2018	152,426	681,901	11,444,656	56,634,582	22.4	1.3	0.3
2019	154,788	694,380	11,639,215	57,540,735	22.3	1.3	0.3
2020	157,187	707,087	11,837,082	58,461,387	22.2	1.3	0.3
2021	159,624	720,026	12,038,312	59,396,769	22.2	1.3	0.3
2022	162,098	733,203	12,242,964	60,347,118	22.1	1.3	0.3
2023	164,610	746,621	12,451,094	61,312,671	22.0	1.3	0.3
2024	167,162	760,284	1,266,762	63,189,270	22.0	1.3	0.3
Annual growth rate (%)	1.55%	1.83%	1.7%	1.6%			

Based on the MLM annual growth rate of 1.55% calculated over the past 5 years in the KZN Community Survey in 2016, it is anticipated that the population will increase to approximately 167,162 by 2024. The population was determined from 2016 to 2024 as this IWMP was prepared for a 5 year period from 2019 to 2024.

(b) Ethnic Profile

The majority of the population of the MLM are black African, who makes up 97.1% of the population, followed by Indian/Asian at 1.8%, and White and Coloured ethnic groups at 0.5% each of the population. With regards to the iLembe District, 89.2% of the population are black African, followed by Indian/Asian at 6.9%, White at 3.4% and Coloured at 0.5% of the population (Statistics South Africa, 2016). Figure 4 below indicates the ethnic profile in the MLM.

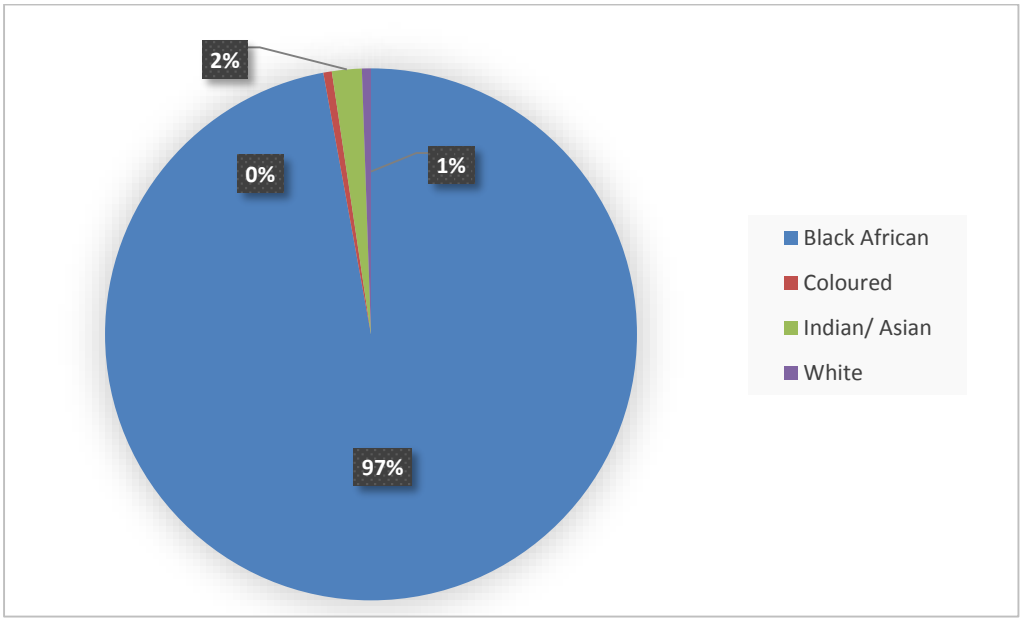


Figure 4: MLM Ethnic Profile *(Statistics South Africa, 2016)*

(c) Gender Profile

Approximately 51.07% of the South African population is female and 48.93% is males. The MLM has a similar ratio of females to males. There are 52.1% females and 47.9% males in the MLM (Statistics South Africa, 2016).

(d) Language

According to the Stats SA KZN Community Survey in 2016 Zulu is the first language of the majority of the population of KwaZulu-Natal Province at 82.5%, followed by English at 12.5% and Xhosa at 3.1% (Statistics South Africa, 2016).

According to the Stats SA, in 2011 Zulu was the first language of the majority of the population in the MLM at 89.6%, followed by English as the second most common spoken first language in the MLM at 4.6%. The other languages spoken in the MLM are isiNdebele at 1.2%, isiXhosa at 0.9%, Afrikaans at 0.8% and Sign Language at 0.8%

(e) Impact of HIV / AIDS

According to a study conducted by the Human Science research Council and published in 2018 (SABC, 2018), the KZN Province remained the province with the highest number of people living with HIV in South Africa. Results of the survey indicate that over 2.1 million are living with HIV in the KZN province and 7.9 million in South Africa are living with HIV A total of 27% of the South Africans living with HIV are located in the KZN Province. With a total population of 11,065,240 people in the KZN Province, this indicates that 19% of the KZN population are living with HIV (Statistics South Africa, 2016).

(f) Access to Piped Drinking Water

According to the Stats SA KwaZulu-Natal Provincial Profile Community Survey in 2016 (Statistics South Africa, 2016), 71% of the households in the iDM had access to safe drinking water and 82% of the households in the MLM had access to safe drinking water. The sources of the safe drinking water to these households that have access are provided in the table below. The KZN Community Survey also indicates that 33,191 households within the MLM, 73%, have water supplied by the municipality and 6,306 households have water supplied by other water schemes (e.g. community water supply). Table 12 below indicates the source of safe drinking water for the households in the MLM and iDM.

Table 12: Sources of safe drinking water

	Mandeni Local Municipality		iLembe District Municipality	
Source of Safe Drinking Water	**No. households**	**% of households**	**No. households**	**% of households**
Piped (tap) water inside the dwelling	7 355	16.1%	34 994	15.5%
Piped (tap) water inside the yard	14 720	32.2%	44 118	19.5%
Piped water on community stand	9 537	20.9%	55 582	24.6%

Rain-water tank in yard	1 010	2.2%	3 384	1.5%
Borehole in and outside the yard	584	1.3%	2 271	1.0%
Neighbours tap	1 300	2.8%	3 029	1.3%
Public/communal tap	1 707	3.7%	7 200	3.2%
Water-carrier/tanker	6 380	14.0%	12 527	5.5%
Flowing water/stream/river	2 940	6.4%	25 358	11.2%
Other Source	146	0.3%	2 906	1.3%
Total	**45 678**		**225 797**	

(g) Access to Electricity

According to the Stats SA KwaZulu-Natal Provincial Community Survey in 2016, 165,638 households in the iDM had access to electricity and 41,652 of households in the MLM had access to electricity. The sources of electricity to these households that have access are provided in the Table 13 below.

Table 13: Sources of Electricity

Source of Electricity	Number of households in MLM	Percentage of households in the MLM	Number of households in iDM	Percentage of households in the iDM
In-house conventional meter	2 734	6.00%	21 992	11.5%
In-house prepaid meter	35 106	76.9%	131 692	68.8%
Connected to other sources which household pays for	1 911	4.2%	6 615	3.5%
Connected to other sources which household does pays for	1 650	3.6%	3 251	1.7%
Generator	-	-	44	0.0%
Solar home system	15	0.03%	250	0.1%
Battery	-	-	49	0.0%
Other	236	0.5%	1 743	0.9%
No access to electricity	4 026	8.8%	25 731	13.4%
Total	45 678	100%	191 369	100%

(h) Waste Removal

According to StatsSA since 2001 it has been recorded that many rural areas in MLM have not received adequate waste removal services. More recently according to the 2016 Stats SA KZN Provincial Community Survey, 24.3% percentage of households in the MLM was reported to be receiving a weekly

waste removal service from the municipality, 0.6% of the households were receiving a less than weekly waste removal service from the municipality and 9.9% use a communal refuse container or central collection point. Of concern is that 58.5% of households were reported as using their own refuse dump (Statistics South Africa, 2016). The Table 14 below indicates the type of refuse disposal and percentage of households receiving this disposal in the MLM in 2001, 2011 and 2016.

Table 14: Type of refuse removal in the MLM for 2001, 2011 and 2016

Type of refuse disposal	2001 (%)	2011 (%)	2016 (%)
Removed by local authority / private company at least once a week	29.8	27.5	24.32
Removed by local authority / private company less often		1.7	0.59
Communal container/central collection point			9.9
Total households receiving a basic serviced	**29.8**	**29.2**	**34.81**
Communal refuse dump		3.5	4.65
Own refuse dump		60.5	58.54
No rubbish disposal		5	1.60
Other		1.8	0.41
Total households not recieveing a basic service	**70.2**	70.8	65.2
TOTAL	**100.00**	**100.00**	**100.0**

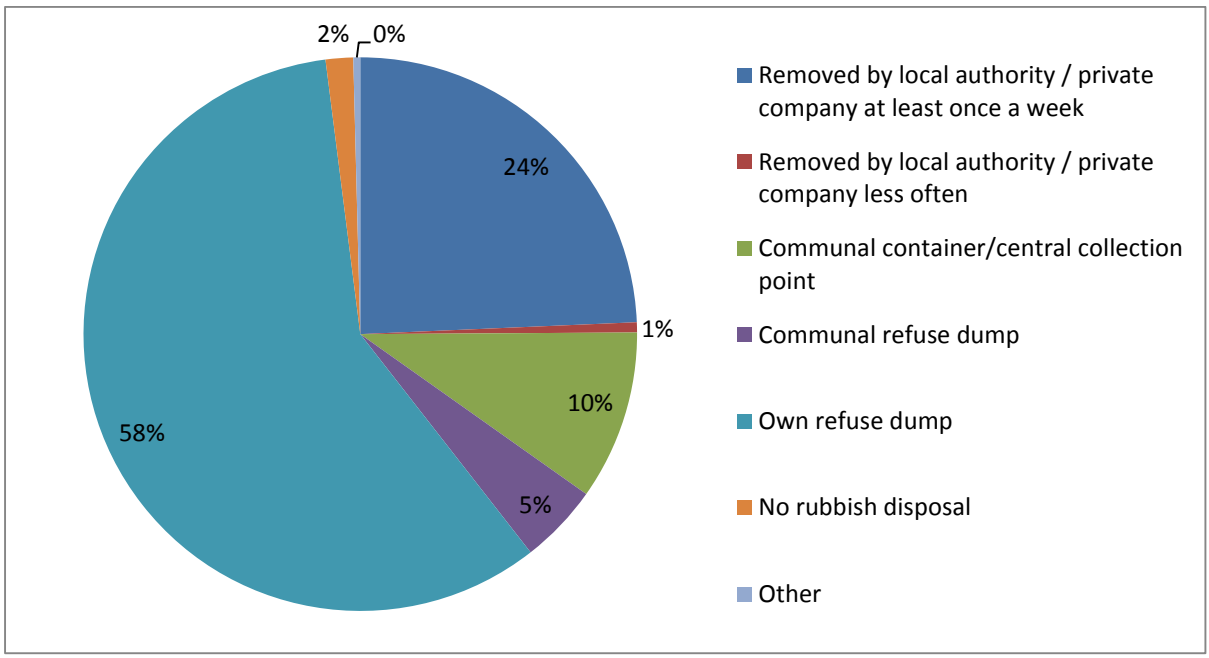


Figure 5: Overview of access to waste disposal services in Mandeni Local Municipality in 2016 (data source, Community Survey 2016).

Statistics show that the number of households in MLM receiving a waste collection service has increased over the last 5 years from 29.2% in 2011 to 34.8% in 2016 as the municipality has been broadening their collection service to include more households in rural areas.

The last 15 years have shown that the number of households receiving a weekly refuse removal service has decreased in the MLM from 29.8% in 2001, to 27.5% in 2011 to 24.3% in 2016. This could mean that the collection services have not been keeping up with establishment of new housing developments within MLM over the last 15 years or that the quality of service has dropped over the last 15 years.

As part of the Stats SA KZN Community Survey (Statistics South Africa, 2016) residents were asked to rate refuse removal services quality in their municipality. While these results are applicable to the iLembe District Municipality and not specific to MLM, they give an indication of the status of service delivery in the district as a whole. The results are shown in the figure below.

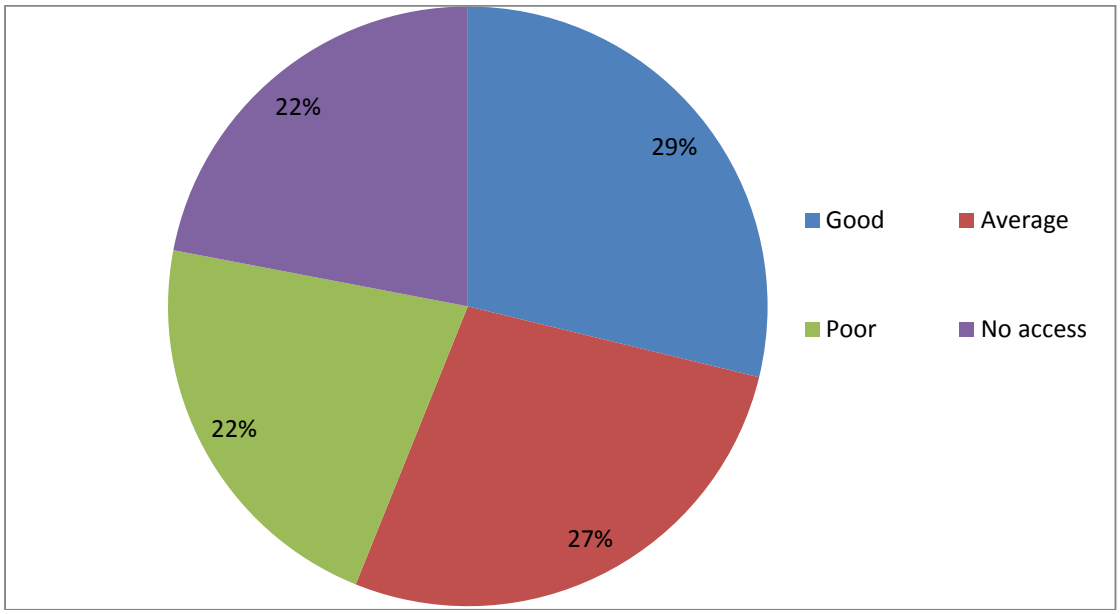


Figure 6: Residents ratings of the quality of refuse removal services (Statistics South Africa, 2016)

Comment on Stats SA data sets

The section below presents two different Stats SA data sets.

1. The 2011 Census data

2. The 2016 Community Survey data

The 2011 Census surveyed all South African households. This data is 7 years old but it remains the most up to date complete census data set for the country. The 2016 Community Survey data is more recent (2016), however only a sample (8.1%) of South African households were surveyed during this census. The Community Survey was designed to be a representative sample of South African households.

3.1.2 **Local Economy**

The main contributors to the MLM's local economy and sources of employment are agriculture, manufacturing, elementary work, plant and machine work. Agriculture is the main employment sector in the MLM where the bulk of the commercial agriculture is sugar cane farming and subsistence farming in the traditional land areas. The largest contributor to the MLM gross GDP is the manufacturing sector. In 2011 it was reported that approximately 60% of the MLM GDP was generated by the manufacturing sector. Agriculture is the second highest contributor to the Mandeni GDP with approximately 8.3%. Wholesale and retail were the third largest contributors to the GDP with approximately 8%. The tourism industry at the Tugela mouth also contributes to the local economy as the area is well known for the battles between the Zulus and the British in the area through King Cetshwayo (Statistics South Africa, 2011). The major commercial operators in the MLM are the Amatikulu sugar mill, the Sappi Paper Mill and the iSithebe Industrial Estate (IMQS, 2019).

According to the KZN Provincial Growth and Development Plan, the agricultural sector contributes 8% towards employment in iDM. While this is a relatively low contribution to employment in the district, the agricultural industry is growing and increasing employment within the agricultural sector has been set as a primary economic goal for the province (The Department of Provincial Planning Commission, 2016).

While the unemployment rate in the MLM is high (28.6%), the MLM as well as the Kwa-Zula Natal province has prioritised the development of housing, health care and commercial complexes which will provide work opportunities. A key area of focus is education in the population, with only 3.5% of the MLM population having an education level higher than secondary school; however, 74.5% of the population have completed secondary school. Also of concern is the income level of the majority of the

households in the MLM, with 89.1% of households with an average of 3.5 people per household surviving on less than R6,300 per month.

3.2 Implementation of 2015 Mandeni Local Municipality Integrated Waste Management Plan

The 2015 MLM IWMP identified ten priority areas namely:

- Priority 1: Management and Resourcing
- Priority 2: Waste information management
- Priority 3: Enforcement of waste bylaws
- Priority 4: Waste minimisation
- Priority 5: Waste Collection
- Priority 6: Waste Transfer and Disposal
- Priority 7: Illegal Dumping
- Priority 8: Waste Management Awareness
- Priority 9: Tariff structure and customer database
- Priority 10: Monitoring

Each priority consisted of a target with a set of objectives to reach the target. A total of 31 targets were identified under the ten priority areas. A review of the implementation status of each of the 31 targets was undertaken to determine progress made with regard to waste management since the 2015 IWMP.

Projects have been classified as complete, in progress, not commenced or not applicable. The timeframes for projects have not been considered, for example, if the deadline for a project was 2016, but it was only completed in 2018, it is still listed as complete. Findings of the review of the implementation of the 2015 IWMP targets are as follows:

Completed:	8 (26 %)
In progress:	4 (13%)
Not commenced:	19 (61%)
Not applicable:	0
Total projects:	31(100%)

A detailed list of the 2015 IWMP objectives and targets and whether or not they were achieved, or are still in progress, is indicated in Table 15 below.

Table 15: Implementation status of the 2015 Mandeni Local Municipality IWMP Targets

Project	Status	Comments
Priority Area 1: Management and Resourcing		
1.1 Designate a WMO	Incomplete	A WMO was designated and appointed; however, the designated WMO was no longer employed by the MLM at the time of review of the IWMP in 2019. A new WMO needs to be appointed and designated.
1.2 Review organogram	In progress	The organogram for the Waste Department was reviewed in 2017, but was not documented or formally done. The organogram was reviewed based on needs to provide and extend the waste collection service in the MLM.
1.3 Create and fill new posts as required	Incomplete	New posts in the organogram have not been filled.
Priority Area 2: Waste information management		
2.1. Establish a Waste Information System (WIS)	Incomplete	A WIS was not established within the MLM. The waste supervisor manages receipts for waste disposed of at the uThungula landfill which contains information about the mass of waste disposed of at the landfill site, but does not collate this into a WIS.
2.2 Review Waste Information Regulations and comply	Incomplete	This was not done by the MLM.
2.3 Register MLM on SAWIS and report tonnages	Incomplete	The MLM has not registered on SAWIS and tonnage reports are not being submitted by the waste department on SAWIS.
2.4 Review complaints management system	Incomplete	The MLM has no system to manage complaints.
2.5 Bi-ennial waste characterisation	Incomplete	No waste characterisations have been done by the MLM. The first waste characterisation was conducted as part of this IWMP. A review of waste types collected at the iSithebe industrial park was conducted in 2015 as part of the 2015 IWMP and Section 78 study. A physical waste characterisation was not undertaken as part of this study.
Priority Area 3: Enforcement of waste by laws		
3.1 Develop an enforcement plan with fining protocols	Incomplete	An enforcement plan with fining protocols was not developed.
3.2 Create a waste ranger post	Incomplete	No waste ranger post was created by the waste management department.
3.3 Provide training to all MLM Peace Officers	Incomplete	No training was provided to MLM Peace Officers.

Project	Status	Comments
3.4 Run campaign to ensure waste service providers are registered in terms of the waste by-laws	Incomplete	No such campaigns were undertaken within the MLM.
Priority Area 4: Waste Minimisation		
4.1 Feasibility study for recycling at Isithebe Industrial Estate	Complete	A feasibility study for the collection of waste by the MLM at the iSithebe Industrial Estate was undertaken in 2015. This study looked at the potential recyclable waste generated in the iSithebe Industrial Estate. An additional waste efficient study was undertaken by the Vuthela LED programme which focussed on the reuse and recycling of waste from the businesses in the MLM, specifically the iSithebe Industrial Estate.
4.2 Feasibility study for development of 1 local recycling co-op	Incomplete	No feasibility study was done for the development of one co-op doing recycling within the MLM.
4.3 Develop an internal paper recycling programme	Complete	An internal paper recycling programme was created within the MLM. Recycled paper is collected by a private waste recycler based within the MLM.
4.4 Establish and manage 1 recycling drop off centre in Mandeni	Incomplete	No recycling drop off centre was created in the MLM.
Priority Area 5: Waste collection		
5.1 Develop a plan to expand communal skip collection in rural areas (areas, timeframes, associated costs	In progress	There is no formal documented plan for the expansion of the communal skips (ad hoc). However, a mapping exercise for the expansion of the skip service was undertaken and the number of skips was increased in rural areas in the MLM.
5.2 Extend communal skip collection system by 100% by 2019 (double number of skips).	Complete	The communal skip collection system was extended to wards 3, 10, 11, 12, 16, and 17 therefore currently all wards receive a skip waste collection service. A total of 80 skips were placed in low density residential areas and rural areas in 2015 (GIBB, May 2015). Currently, a total of 108 skips are placed throughout the MLM in low density residential areas and rural areas. A total of 30 new skips have been budgeted for and purchased within the 2019/2020 financial year. These will be used to replace 13 skips and extend the waste collection skip system. A total of 125 skips will then be used within the MLM.
Priority Area 6: Waste Transfer and Disposal		
6.1 Develop a public garden refuse transfer station by 2016	Incomplete	A public garden refuse transfer station was not created in the MLM.

Project	Status	Comments
(section 23(1)(b) of waste by-laws)		
6.2 Provide a facility for the disposal or transfer of builder's rubble (section 26(1) of bylaws).	Incomplete	A facility for the disposal or transfer of builder's rubble was not created in the MLM
6.3 Develop a composting facility	Incomplete	The MLM investigated various options to establish a composting facility, but a composting facility was not created in the MLM.
Priority Area 7: Illegal dumping		
7.1 Dumping hotspot assessment	Complete	A dumping hotspot assessment was completed in the 2018 for the MLM.
7.2 Remediate existing hotspots and implement prevention measures	In progress	Cleaning and collection of waste has been done by the waste department at certain hotspots in the MLM. However, dumping at these hotspots has continued once the areas were cleaned. The MLM has used 100 EPWP workers for litter picking and illegal dumping clean-up campaigns. The waste department has tried to purchase a TLB and 8 ton truck to collect waste from illegal dumping spots, but this was difficult to achieve due to financial and budget constraints. A TLB and truck which belong to the technical services department are used when available to clean up waste at the dumping hotspots. A total of 50 "no dumping" signs were requested by the waste department, but this has not been approved and purchased to date.
7.3 Undertake annual surveys of illegal dumping hotspot and remediate them	Complete	Annual surveys of illegal dumping hotspots were undertaken by the MLM. Cleaning and collection of waste has been done by the waste department at certain hotspots in the MLM. The MLM indicated that it has been difficult for the municipality to remediate the dumping hotspots, as dumping continues at these hotspots once cleaned.
Priority Area 8: Waste Management Awareness		
8.1 Plan annual calendar of awareness campaigns	In progress.	A documented plan for awareness campaigns was not developed by the MLM. Waste awareness campaigns were undertaken with "Youth Jobs In Waste" Programme during 2016 and 2017 at schools and within the communities in the MLM. The programme stopped in 2017 and waste awareness campaigns are now undertaken occasionally within the MLM and when requested by councillors.
8.2 Undertake at least 4 recycling awareness campaigns per year	Complete	Approximately 10 waste awareness campaigns are conducted per year. Recycling of waste was discussed during these awareness campaigns. Two awareness campaigns were budgeted for by the waste department for the 2019/2020 financial year.

Project	Status	Comments
8.3 Support at least 1 government or private training and awareness campaigns	Complete	The MLM has supported the Youth Jobs in Waste Programme when the programme was active during 2016 and 2017 in the MLM. One of the areas the programme focussed on was awareness campaigns.
8.4 Develop a “how to handle waste leaflet” (contact details, recycling, hazardous waste, illegal dumping, etc.)	Incomplete	A waste management leaflet has not been created within the MLM.
Priority Area 9: Tariff Structure and Customer Database		
9.1 Undertake a full cost accounting to determine true cost of waste management function	Incomplete	A full cost accounting exercise to determine the true cost of waste management has not yet been undertaken by the MLM.
9.2 Develop a system of registering houses on tribal land	Complete	The registering of houses on tribal land is ongoing within the MLM. The Vuthela LED programme has commenced with registering indigent households in the MLM.
Priority Area 10: Monitoring		
10.1 IWMP implementation monitoring system on an annual basis	Incomplete	An annual review of the IWMP implementation plan was not done by the waste management department.

3.3 Progress towards Compliance with National Waste Management Strategy Goals

A review of the progress in the MLM with regards to the implementation of the 2011 NWMS goals and targets was undertaken as part of the IWMP. Where information was available, an assessment of the compliance with each of the targets was undertaken and documented.

Table 16: National Waste Management Strategy Objectives

Goal	Targets for 2016	MLM Progress to compliance with National targets
Promote waste minimisation, re-use, recycling and recovery of waste.	25% of recyclables diverted from landfill sites for re-use, recycling or recovery.	According to SAWIS data, metals, paper and plastic are recycled. However, this is not 25% of all recyclables that could be diverted from landfill. One municipal recycling initiative and several private recycling initiatives are underway in the MLM; however, there is no mass or volume data to indicate the mass of recycled material that is diverted away from landfill.

	All metropolitan municipalities, secondary municipalities, and large towns have initiated separation at source programmes.	No separation at source programme has being undertaken except for paper recycling within the municipal offices. There is also no plan in place to commence with separation at source within the MLM.
	Achievement of waste reduction and recycling targets as set in industry waste management plans (indWMP) for paper and packaging, pesticides, lighting (CFLs) and tyre industries	The REDISA tyre IndWMP has been withdrawn therefore the targets are no longer applicable. The indWMPs for the paper and packaging industry, e-waste, lighting and tyre industries have been submitted to DEA for adjudication.
Ensure the effective and efficient delivery of waste services.	95% of urban households and 75% of rural households have access to adequate levels of waste collection services. 80% of waste disposal sites have permits.	According to the KZN Community Survey (Statistics South Africa, 2016), 34.8% of the population (both urban and rural areas combined) receive a waste collection service. Urban areas receive a kerbside waste collection service and some rural areas receive a communal waste collection service using waste skips. There are no waste disposal sites in the MLM that require a permit. The private landfill sites are licenced.
Grow the contribution of the waste sector to the green economy	69,000 new jobs created in the waste sector. 2,600 additional SMEs and cooperatives participating in waste service delivery and recycling	These are national targets, and there are no equivalent local targets. In the MLM, 41 people are employed within the waste department of the municipality.
Ensure people are aware of the impact of waste on their health, well-being and the environment.	80% of municipalities running local awareness campaigns. 80% of schools implementing waste awareness campaigns.	Ward community meetings are regularly held by ward councillors and waste issues are discussed to educate the public on best practice. During 2016 and 2017 waste awareness campaigns were undertaken with the “Youth Jobs In Waste” programme. Representatives of the EDTEA have joined the MLM staff on school visits to educate scholars regarding waste management. No records were available of exactly how many such activities have been undertaken.
Achieve integrated waste management planning.	All municipalities have integrated their IWMPs with their IDPs, and have met the targets set in IWMPs All waste management facilities required to report to SAWIS have waste quantification systems that report information to WIS.	The 2017/2018 IDP was informed by the goals and targets of the 2015 IWMP. However, the targets of the IWMP with associated financial costs were not fully incorporated into the 2017/2018 IDP and annual budgets. Twenty six percent (26%) of the targets in the 2015 IWMP have been met, and thirteen percent (13%) of the targets are still in progress. The King Cetshwayo regional landfill site landfill site does provide disposal tonnages to the MLM as part of their invoicing process, however, these are not collated by the MLM into one report or document. The King Cetshwayo municipality is responsible for

		uploading waste disposal tonnages for the MLM as the waste collected in the MLM is disposed of at the King Cetshwayo regional landfill site.
Ensure sound budgeting and financial management for waste services	All municipalities that provide waste services have conducted full-cost accounting for waste services and have implemented cost reflective tariffs.	A full cost accounting for waste services has not been conducted by the MLM and tariff increased have therefore not been guided by this. The tariffs were determined by the municipality based on what the community was able to pay and are increased annually by 6-7%.
Provide measures to remediate contaminated land.	Assessment complete for 80% of sites reported to the contaminated land register. Remediation plans approved for 50% of confirmed contaminated sites.	An assessment to determine contaminated and polluted land (illegal dumpsites) within the MLM has been undertaken and remediation and rehabilitation plans were determined. Waste has been removed from illegal dumpsites and the MLM has partially remediated illegal dumpsites. However, once dump sites are cleaned the communities continue with dumping waste at these sites. Historic landfill sites within the MLM have been correctly rehabilitated and closed.
Establish effective compliance with and enforcement of the Waste Act	50% increase in the number of successful enforcement actions against non-compliant activities. 800 environmental management inspectors (EMIs) appointed in the three spheres of government to enforce the Waste Act.	Waste management by-laws have been developed and are approved for the MLM. However there are no staff (e.g. traffic officers) that act as EMIs and that can issue spot fines for illegal waste dumping. The MLM has also not designated any peace officers as waste rangers to implement the waste by laws.

3.4 Waste Profile

In order for municipalities to be able to plan for future waste management activities the types and volumes of waste generated in the area needs to be determined. All municipalities are required by law to determine quantities and types of waste generated within their municipal boundary. This involves establishing the current quantities of waste generated, recycled, treated and disposed of.

3.4.1 Waste Collection Information

A number of sources were considered to determine the total amount of waste collected and disposed to landfill in the MLM:

- 2009 IWMP. According to the review of the 2009 IWMP, approximately 7,000 tonnes of domestic waste was collected and disposed of annually within the MLM. This waste collection data was provided by the waste service provider that was appointed to collect domestic waste and garden refuse within the MLM (GIBB Engineering and Science, 2009).

- 2013 Collection Contract Review (unpublished data). In 2013 Gibb undertook a review of the waste collection contract between the then current waste collection service provider (Mandeni Waste Removal cc) and the MLM. A review of the contractor's invoices and weighbridge receipts from the landfill suggested that approximately 700 tonnes/month (8400 tonnes per year) of domestic waste was being collected by the contractor. This includes kerb-side collections and skip collections.

- 2015 IWMP. According to the review of the 2015 IWMP, approximately 8,000 tonnes of domestic waste and garden refuse was collected annually within the MLM. This waste collection data was provided by the company Mandeni Waste Removal Services that was appointed to collect domestic waste and garden refuse within the MLM (GIBB, May 2015).

- 2019 data. According to the waste tonnage information provided by the MLM for this IWMP, approximately 2,221.8 tonnes was collected and disposed of for the 6 months from January to June 2019. Annualized this equated to 4,443.60 tonnes per year.

Noteworthy is that data from 2009, 2013, and 2015 all suggested that in excess of 7,000 tonnes of waste was being collected and disposed of by the MLM. The latest 2019 figures however suggest approximately half of this is being disposed of. The validity of the latest figures should be verified.

3.4.2 Estimated waste generation quantities

Determining the actual quantities of waste generated in a region is extremely difficult to achieve through the use of actual waste records, especially in a largely rural municipality such as this which has a large rural component and many households burn or bury their waste. The amount of waste generated has

therefore been estimated through a theoretical calculation which considers the number of people in the municipal area and the waste typically generated per capita.

The 2006 South Africa State of Environmental Report (SOER), (Department of Environmental Affairs, 2006) calculated waste generation volumes per income level as follows:

- Low income 0.41 kg/ person/ day = 149.65 kg/ person/ year
- Middle income 0.74 kg/ person/ day = 270.1 kg/ person/ year
- High income 1.29 kg/ person/ day = 470.85 kg/ person/ year.

The SOER figures for waste generation are also used in the Department of Environmental Affairs Guideline for the Development of Integrated Waste Management Plans (IWMPs). The DEA IWMP guideline also defines the following income brackets:

- Low income: R 0 – R 74,999 per year
- Middle income: R 75,000 – R 999,000 per year
- High income: R 1 million + per year.

It is assumed that that the numbers of people per households in high, middle and low income households are the same. We have correlated these income brackets as closely as possible with the income groups percentage provided in the 2011 census data (Statistics South Africa, 2011) and the total number of households and population figures from the Stats SA KwaZulu-Natal Provincial Community Survey in 2016.

Table 17: Summary of size of income groups in the MLM (Statistics South Africa, 2011)

Income group	Annual Household Income	Percentage from StatsSA 2011	Nr. of households as per the KZN Community Survey	Nr. of people as per the KZN Community Survey
Low	No income	13.4%	6,121	19,806
	R1 - R 4,800	5.4%	2,467	7,982
	R4,801 - R9,600	10.4%	4,751	15,372
	R9,601 - R19,600	25.7%	11,739	37,987
	R19,601 - R38,200	22.8%	10,415	33,700
	R38,201 - R76,400	11.5%	5,253	16,998
Low sub-total		*89.2%*	40,745	131,845
Middle	R76,401 - R153,800	5.6%	2,558	8,277

	R153,801 - R307,600	3.2%	1,462	4,730
	R307,601 - R614,400	1.6%	731	2,365
	R614,401 - R1,228,800	0.2%	91	296
Middle sub-total		*10.6%*	4,842	15,668
High	R128,801 - R 2,457,600	0.1%	46	148
	R2,457,601+	0.1%	46	148
High sub-total		*0.2%*	92	296
Total			45,678	147 808

The population of MLM per income bracket is as follows:

- Low income: 89.2 %
- Middle income: 10.6 %
- High income: 0.2 %

Based on the number of persons per income bracket, the predicted annual waste generation figures have been calculated and presented in the table below. It is estimated that **24,102** tonnes of waste was produced in the MLM in 2016 according the population figures of 2016 and waste generation volumes per income group.

Table 18: Estimated quantity of waste generation per household in income groups in the MLM in 2016

Income group	Estimated Generation quantities per income group (tons)			
	Per day	**Per week**	**Per month**	**Per year**
Low income	54.06	378.42	1,644.22	19,730.60
Middle income	11.59	81.13	352.66	4,231.92
High income	0.38	2.67	11.60	139.19
Total	**66.03**	**462.22**	**2,008.48**	**24,101.71**

Using this waste generation figure and the population growth rate of 1.55% per year for the MLM as indicated in the 2016 KZN Community Survey, it is estimated that **25,240 tonnes** of waste would be generated in 2019.

Assuming that the waste tonnages gathered from January to June 2019 by the MLM is an accurate representation of waste collected within the MLM, and calculating that 4,443.60 tonnes of waste would be collected in 2019, it is calculated that only 17.6% ($\frac{4{,}443.60 tonnes}{25{,}239.9\ tonnes} \times 100\%$) of domestic and garden waste generated in the MLM is collected and disposed of at the King Cetshwayo regional landfill site.

3.4.3 Waste Characterisation of Domestic Waste Stream

The section below presents the outcomes of a waste characterisation exercise that was undertaken simultaneously for the MLM and KwaDukuza Local Municipality in August 2018. Only the results for the MLM have been presented below.

(a) Survey Areas

The domestic waste profile can vary between different income levels and waste was therefore collected from both high and low income areas in the municipal area, as shown in the table below.

Table 19: Waste Characterisation Details

Area	Income Status	Survey Date	No. of Houses Surveyed	No. of black bags collected	Total Waste Separated (kg)
Mandeni Local Municipality					
Mandini suburb	Medium - High	22 August 2018	8	15	73.3 kg
Isithebe	Low	22 August 2018	Waste collected from 5 skips	15	78.9 kg

(b) Characterisation Methodology

The characterisation study was executed using the following methodology:

(i) Planning

Survey target areas of different incomes were selected.

(ii) Execution

- Waste was collected using a municipal team on the morning of normal collection days. The collection was done using a light utility vehicle, early on collection day, before the normal collection round was undertaken.
- All waste from specific houses in Mandini suburb was collected; there was no selective collection of waste. All the waste put out for collection at each of these houses was collected to ensure the results were not skewed due to any type of separation of waste types into different bags or containers. Where it was evident that more than one household had placed waste together outside

one house, this waste was not collected. Isithebe does not receive a kerbside collection service so waste was collected from five different communal skips.

- Waste from the municipality was taken to KwaDukuza transfer station for sorting. The waste characterisations for Mandeni LM and Kwadukuza LM were conducted on the same day; however, waste was collected, sorted and assessed separately.

- The GIBB project team provided a training session to KLM and MLM employees before the sorting occurred. A translator was used to translate the training from English to Zulu. The training covered:

    - The importance of waste characterisations
    - Sorting procedure
    - Identification of different categories of waste
- Waste was sorted by a team which consisted of:
    - 4 GIBB employees
    - 4 KLM waste department employees
    - 9 MLM waste department employees
- Waste was transferred onto four sorting tables. Black bags were sorted to completion, one at a time. This was to prevent the accumulation of unsorted, smaller items on the tables.
- Waste was sorted according to type, as indicated in the table below.
- Sorted waste was placed into empty wheelie bins labelled for different waste types (as shown in Table 20 below). These bins where weighed before and after to determine the mass of waste received. The 1m^2 electronic scale at the municipal stores was use to weigh the wheelie bins. Results were recorded on field sheets.
- The plastics fraction was then further separated according to type of plastic.
- Once weighed, the contents of all wheelie bins were returned to the light utility vehicle and the waste was taken to landfill.

Figure 7: Collection of waste from Mandeni, a high income suburb (left), and from a communal skip in Isithebe (right)

Table 20: Waste characterisation categories used in the waste characterisation exercise

Category	Examples
Paper (general)	High quality paper, 'office paper'
Paper (other)	Magazines 'plasticized paper'

Category	Examples
Cardboard (corrugated)	Corrugated boxes
Cardboard (non-corrugated)	Cereal boxes
Metal	Drinks cans, foil
e-waste	Electrical components – computers, calculators, cell phones
Organics (garden waste)	Grass cuttings, leaves
Organics (food waste)	Vegetable peelings, fruit
Organics (wood waste)	Tree stumps and branches
Plastics 1. PET	Soft drink bottles, carbonated drink bottles
Plastics 2. PE-HD	Milk bottles, shampoo bottles
Plastics 3. PVC	Water piping
Plastics 4. PE-LD	Bread bags
Plastics 5. PP	Microwaveable containers
Plastics 6. PS Polystyrene	Take away cartons, hot drink cups
Plastics 7. Other	CD's
Glass (all colours)	Glass bottles, glass jars
Construction waste	Builder rubble, bricks
Hazardous waste	Batteries, fluorescent bulbs, paints
Health care risk waste	Sharps, medication
Nappies	Nappies
Other	Fabrics – old clothes, furniture
Fines	Mixed material too small to be sorted

Figure 8: Waste characterisation underway at the KwaDukuza Transfer Station

Figure 9: Sorting tables and bins set up (left), weighing of bins (right)

The DEA IWMP toolkit references the Stats SA guideline for sampling which indicates that sample size should comprise 30% of the total number of households. Thus ideally the sample should have included waste from over 27,385 households in KLM and 13,703 households in MLM. This was not possible within the scope of this study. The scope of the waste characterisation as set out in the service level agreement for this IWMP limited the study to a one-day characterisation. According to the United Nations Environmental Programme guideline 'Developing an Integrated Solid Waste Management Plan Volume 1' (UNEP, 2009) the average confidence level achieved by the sample size used in this study (a one-day waste characterisation) is 70%.

This report contains a full methodology of the process employed, and data collection sheets can be provided to the municipalities to allow them to undertake waste characterisations in-house going forward. It is recommended that an annual waste characterisation is undertaken in each municipality. The characterisation should be rotated between different suburbs, and undertaken at different times in the year to account for seasonal variation in waste and variations between different suburbs and income levels.

(c) Waste Characterisation Results

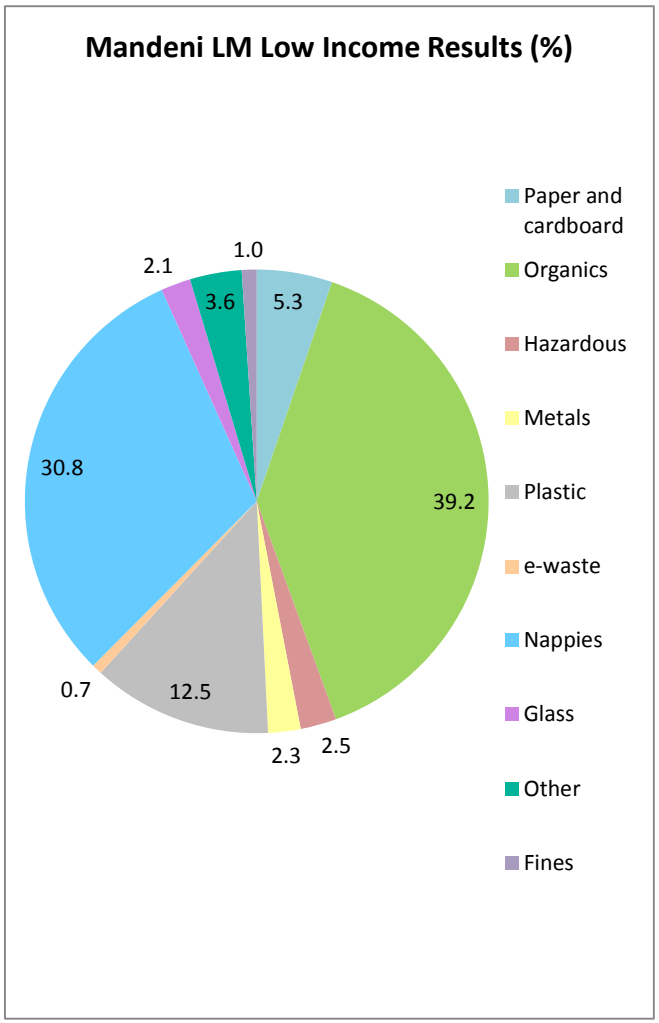
The results for the domestic waste stream characterisation are presented in the following sections. The table below breakdowns down the waste characterisation results for the areas sampled in MLM. The results have also been combined to give an average for the municipality.

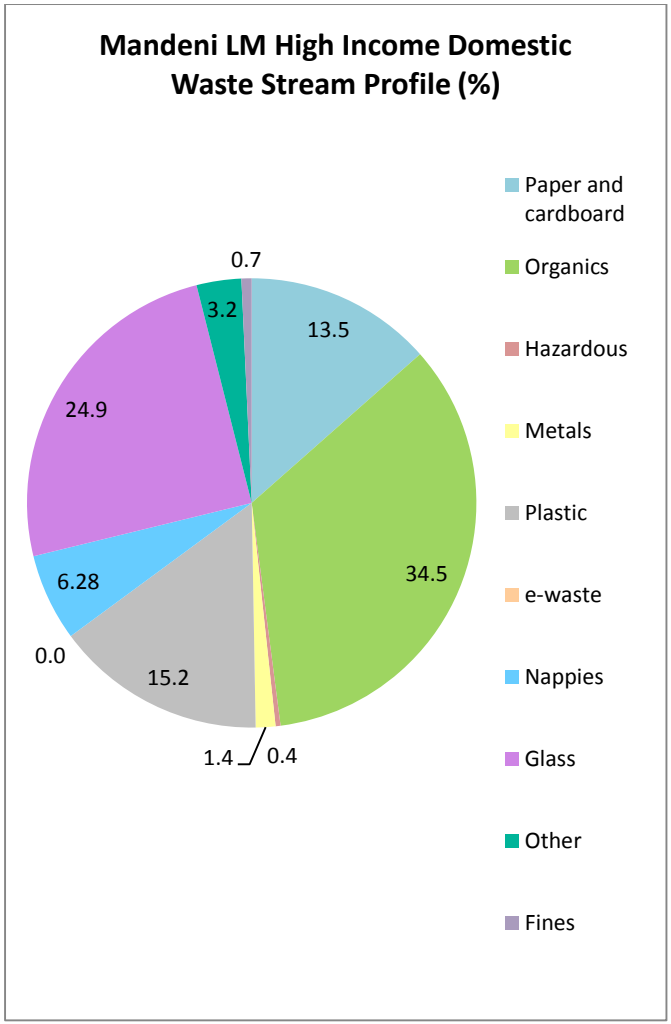
Table 21: Waste Characterisation Results for Mandeni Local Municipality

Waste Category	Quantity (kg) Low Income	% Composition Low Income	Quantity (kg) High Income	% Composition High Income	Combined Quantity (kg)	Combined % Composition
High quality office paper	0.30	0.41	0.10	0.13	0.40	0.26
Paper other	1.00	1.37	4.62	5.85	5.62	3.69
Corrugated cardboard	1.06	1.45	1.28	1.62	2.34	1.54
Non-corrugated cardboard	1.50	2.05	4.64	5.88	6.14	4.03
Paper & cardboard subtotal	**3.86**	**5.27**	**10.64**	**13.48**	**14.50**	**9.53**
Organics - garden waste	4.94	6.74	4.86	6.16	9.80	6.44
Organics - food waste	23.76	32.43	22.34	28.31	46.10	30.29
Organics - wood waste	0.00	0.00	0.00	0.00	0.00	0.00
Organics subtotal	**28.70**	**39.18**	**27.20**	**34.47**	**55.90**	**36.73**
PET Plastic	1.02	1.39	3.88	4.92	4.90	3.22
PE-HD Plastic	2.24	3.06	3.24	4.11	5.48	3.60
PVC Plastic	0.32	0.44	0.18	0.23	0.50	0.33
PE-LD Plastic	2.40	3.28	1.80	2.28	4.20	2.76
PP Plastic	2.18	2.98	2.20	2.79	4.38	2.88
Polystyrene Plastic	0.34	0.46	0.42	0.53	0.76	0.50
Plastics Other	0.68	0.93	0.26	0.33	0.94	0.62
Plastics subtotal	**9.18**	**12.53**	**11.98**	**15.18**	**21.16**	**13.90**
Hazardous waste	0.50	0.68	0.02	0.03	0.52	0.34
Health care risk waste	1.34	1.83	0.26	0.33	1.60	1.05
Hazardous and HCRW subtotal	**1.84**	**2.51**	**0.28**	**0.36**	**2.12**	**1.39**
Nappies	**22.58**	**30.82**	**4.96**	**6.28**	**27.54**	**18.10**
Metal	**1.66**	**2.27**	**1.12**	**1.42**	**2.78**	**1.83**
E- waste	**0.52**	0.71	**0.00**	**0.00**	**0.52**	**0.34**
Glass	**1.52**	2.07	**19.62**	**24.86**	**21.14**	**13.89**
Construction waste	**0.00**	0.00	**0.00**	**0.00**	**0.00**	**0.00**
Other	**2.64**	3.60	**2.54**	**3.22**	**5.18**	**3.40**
Fines	**0.76**	1.04	**0.58**	**0.73**	**1.34**	**0.88**
TOTAL	**73.26**	**100.00**	**78.92**	**100.00**	**152.18**	**100.00**

Table 22: Waste Characterisation Results in Broad Categories for Mandeni Local Municipality

Waste category	% Composition - Low Income Households	% Composition - High Income Households	% Composition – Combined Households
Paper and cardboard	**5.27**	**13.48**	**9.53**
Organics	**39.18**	**34.47**	**36.73**
Plastic	**12.53**	**15.18**	**13.90**
Nappies	**30.82**	**6.28**	**18.10**
Hazardous	**33.33**	**6.64**	**19.49**
Metals	**2.27**	**1.42**	**1.83**
e-waste	**0.71**	**0.00**	**0.34**
Glass	**2.07**	**24.86**	**13.89**
Construction waste	**3.60**	**3.22**	**3.40**
Other	**1.04**	**0.73**	**0.88**
Fines	**1.0**	**0.7**	**0.9**
Total	**5.27**	**13.48**	**9.53**





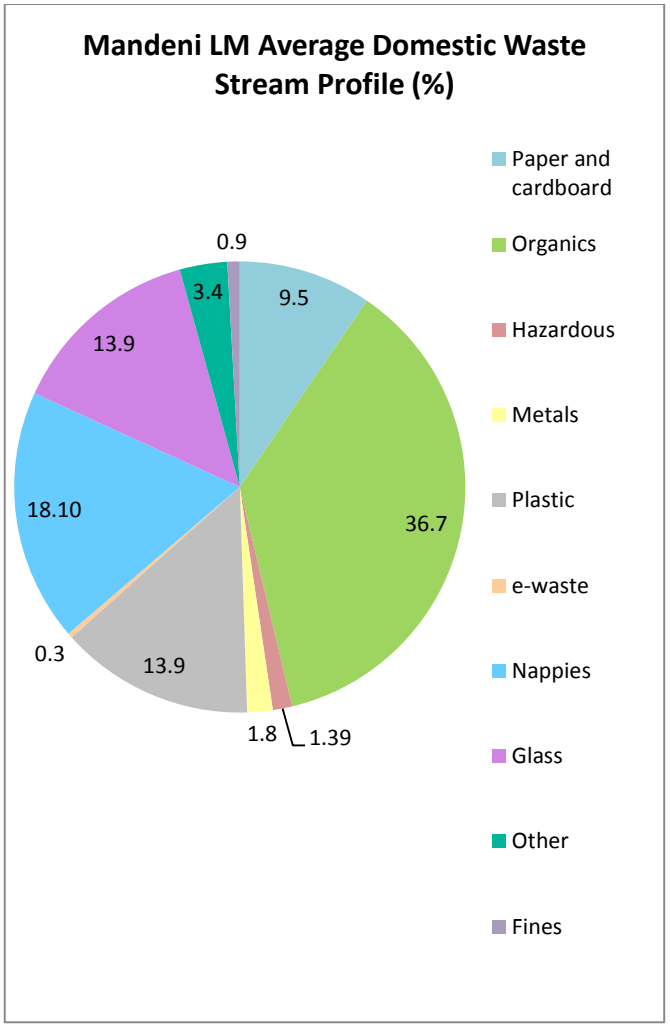


Figure 10: Waste Characterisation Results Summary for Mandeni Local Municipality

(d) Analysis of Results for Waste Characterisation

On average the largest category of the domestic waste was organic waste comprising a total of 36.7% of the waste stream. Organic waste was composed of food waste (30.3%) and garden waste (6.4%). A high proportion of food waste also means that separation at source of recyclables would be required to take full advantage of the recyclable portion of the waste stream because food waste contamination can reduce the quality and quantity of recyclable material. Perishable recyclables such as paper and cardboard are the worst affected by food contamination. A total of 39.0% of the domestic waste stream sample was composed of recyclable materials (paper, cardboard, metal, glass and plastics). The main difference in the waste type profiles of the high and low income waste samples was the portion of nappies; high quantities of nappies were found in the low income waste samples. The other notable difference was the percentage of glass, which was much higher (24.9%) in the high income sample, and lower (2.1%) in the low income sample. Many glass drinks bottles were found in several black bags collected from one of the high income households.

The following observations are made for the different waste types:

(i) Organics

Organic waste was the largest category of waste in the characterisations by weight, 36.7% of the total waste stream. The following sub-categories of organic waste were noted; food waste (30.3%) and garden waste (6.4%). This finding highlights the opportunity for composting of organic waste to significantly reduce the volume of waste disposed to landfill. The high proportion of organic waste also highlights the requirements for regular removal of domestic waste, especially in summer. The percentage of food and garden waste in the low and high income waste samples were very similar.

(ii) Hazardous waste

Hazardous waste constituted 1.39% of the domestic waste stream sample. A small component of hazardous waste consisted of expired pharmaceuticals. The remainder of the hazardous waste stream consisted mainly of paint tins and solvent containers.

(iii) Nappies

Used baby nappies comprised 18.1% of the domestic waste stream. Used nappies are categorised on their own.

(iv) Glass

Glass accounted for 13.9% of the waste sample. The majority of glass was drinks bottles and food jars. It was noted that the majority of the glass was drinks bottles found in several black bags of the high income waste sample. The unusually high portion of glass in the domestic waste is possibly due to a "once off" event such as a party and may not be representative of the true portion of glass in the broader domestic waste stream. It should however be noted that in both areas surveyed, the higher income areas both displayed a much higher glass content than in lower areas.

(v) Plastics

Plastics made up 13.9% of the waste sample. A detailed analysis of plastic is presented in section (e) below.

(vi) Paper and cardboard

In total the paper and cardboard category made up 9.5% of the waste sample, making it the fifth largest component of waste sampled. A detailed analysis of paper and cardboard is presented in the following section.

(vii) Others

This category included textiles, clothing, shoes and insert foam from furniture. It was found from the survey that there was slightly higher 'other' waste type from the low income sample (3.6%) than that from the high income sample (3.2%). It is likely that clothing is donated or sold by high income households and reaches its end of life in low income areas where it is disposed of with general waste.

(viii) Metal

A total of 1.8% of the waste sample was composed of metal. Most of the metal found in the domestic waste stream was empty food tins, aluminium foil and drinks cans.

(ix) Fines

This category included all waste material too small to be sorted and included mostly small fragments of organic material, such a food crumbs, cigarette butts, sand or grit. Fines made up 0.9% of the waste stream. This category gives an indication of the proportion of the domestic waste stream that cannot be composted or recycled because it is mixed organic and non-organic waste. Fines made up a small portion of the waste stream, and could be further reduced if waste was separated at source.

(x) E-waste

E-waste made up a very low 0.3% of the waste sample. This low portion of e-waste may be a result of the low average household income in MLM, with 90% of households surviving on less than R6,500 per month, and over 70% of households surviving on an income of less than R3,000 per month. Mandeni local municipality encompasses a number of recycling businesses and as a result, households may be separating out more valuable wastes such as metals and e-waste so sell to local recycling businesses.

(xi) Construction waste

No construction waste was found in the domestic waste stream. While construction waste usually makes up only a very small portion of the domestic waste stream, there is usually a small fraction of construction waste present. The construction waste from house repairs, demolition or construction may not be present in the waste stream if it has been re-used for construction of informal housing or been illegally dumped.

(e) **Plastics Waste Stream Characterisation**

The plastics fraction of the sample was further separated to better understand the recycling potential for plastics. These were separated into six fractions as shown in the table below.

Table 23: Description of Different Categories of Plastics*.

SPI Code	Type	Acronym	Examples
1	Polyethylene Terephthalate	PET	Fizzy drink and still water bottles.
2	High density Polyethylene	PE-HD	Milk bottles, juice bottles and some detergent bottles, plastic bags.
3	Polyvinyl Chloride	PVC	Plastic pipes
4	Low density Polyethylene	PE-LD	Bread bags, soft plastic bags, cling wrap
5	Polypropylene	PP	Butter and yoghurt containers, crinkly food wrappers
6	Polystyrene	PS	Take away containers and utensils

** Plastic containers are often labelled with a Society of Plastic Industry code (SPI). These codes were devised in 1988 to aid identification of plastics for recycling purposes. Use of the codes on plastic packaging is voluntary.*

The following table presents the plastic characterisation results.

Table 24: Plastic characterisation results

Plastic Category	Combined Quantity (kg)	% of the Total Plastics	% of Total Waste Stream
1 - PET	4.9	23.2	3.2
2 - PE-HD	5.5	25.9	3.6
3 - PVC	0.5	2.4	0.3
4 - PE-LD	4.2	19.8	2.8
5 - PP	4.4	20.7	2.9
6 - Polystyrene	0.8	3.6	0.5
7 – Other plastics	0.9	4.4	0.6
Sub-total	21.2	100.0	**13.9**

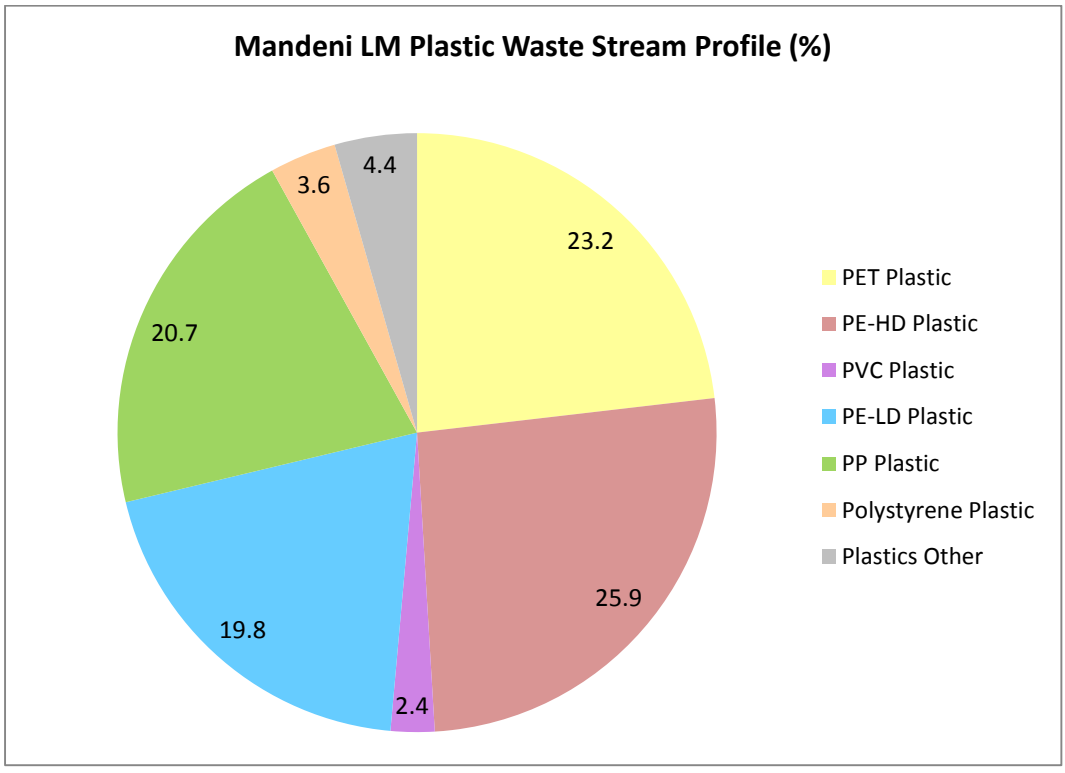


Figure 11: Paper and Cardboard characterisation results for Mandeni Local Municipality

From the above results, one can see that PE-HD, PET and PP, which have the highest potential for recycling, constitute 25.9%, 23.2% and 20.7% of the total waste stream sample respectively.

(f) Paper and Cardboard Waste Stream Characterisation

The paper and cardboard fraction of the sample was further separated to better understand the recycling potential for paper and cardboard. These were separated into four fractions as shown in the table below.

Table 25: Paper and Cardboard Characterisation Results

Paper and Cardboard Category	Combined Quantity (kg)	% of the Total Plastics	% of Total Waste Stream
High quality paper	0.4	2.8	0.3
Paper other	5.6	38.8	3.6
Corrugated cardboard	2.3	16.1	1.5
Non-corrugated cardboard	6.1	42.3	3.9
Paper & cardboard subtotal	**14.5**	**100.0**	**9.2**

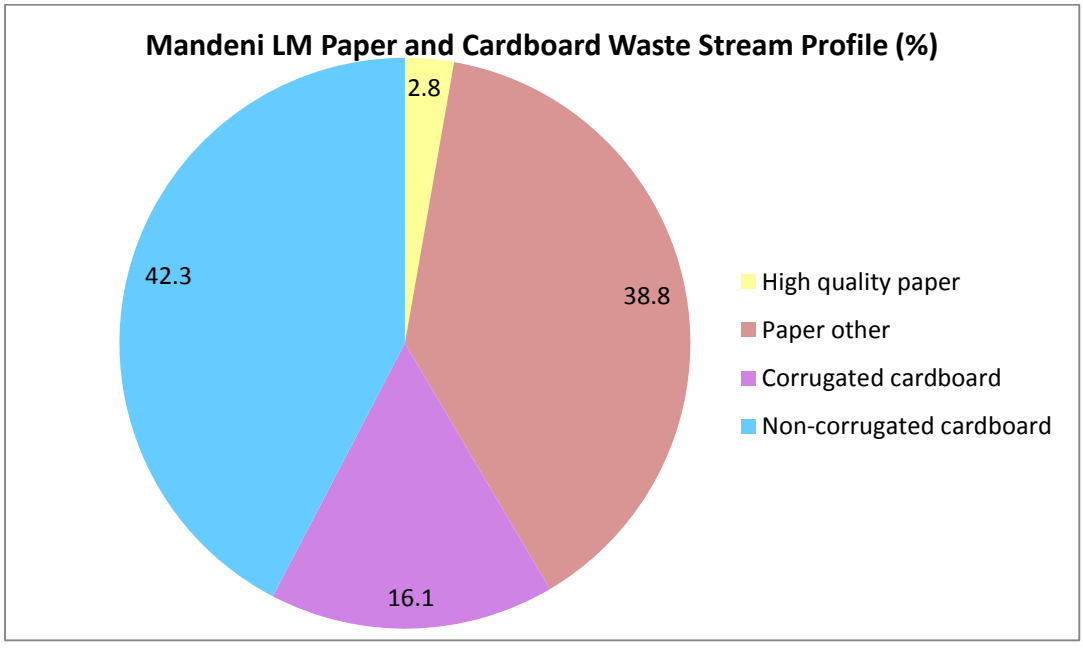


Figure 12: Plastic characterisation results for Mandeni Local Municipality

The majority (42.3%) of the paper and cardboard waste stream was 'non-corrugated cardboard' which consists mainly of food and product packaging. "Other paper" which includes paper food wrappings, tissue paper, newspaper and magazine paper made up 38.8% of the total paper and cardboard stream. Corrugated cardboard, consisting mainly of cardboard boxes, made up 16.1% the paper and cardboard waste stream. Very little (2.8%) high quality 'office' paper was found in the waste stream.

3.4.4 Organic Waste Management Considerations

Results of the waste characterizations for the municipality indicate that a significant portion of the waste stream is composed of organic waste (36.7% in MLM). If organic composting and vermiculture (worm farms) projects were to be introduced in the municipalities, some diversion of domestic waste to landfill could be achieved. In addition, the negative impact associated with landfilling of organic waste, methane emissions, odours, leachate generation and consumption of spoiled food by informal reclaimers could be minimised.

National legislation, in particular the National Norms and Standards for Disposal of Waste to Landfill (GN 636 of 2013) recognizes the need to divert organic waste from landfill. This refers to waste that is collected by the MLM and disposed of at landfill. These norms and standards require a 25% diversion of garden waste from landfill by 2018 and 50% by 2023. In order for MLM to meet these targets, composting of green waste would be required.

(a) Tonnage of Organic Waste Available in the Domestic Waste Stream

Based on the results of the waste characterisation and the hypothetical calculations of domestic waste generation for 2019, the tonnage of organic waste being generated in the municipality can be calculated.

A total of 9,339 tonnes of organic waste is potentially produced by households in the MLM per annum (based on a waste generation of 25,240 tonnes of domestic waste in the MLM for 2019). A breakdown of the different types of organic waste as determined by the waste characterisation is given in the table below.

Table 26: Organic waste generation rates in Mandeni Local Municipality for 2019

Waste category	% of domestic waste stream	Tonnes/ annum
Organics - garden waste	6.4%	1,615
Organics - food waste	30.3%	7,648
Organics - wood waste	0.0%	0.0
Total	**36.7%**	9,263

3.4.5 Recycling Material Management Considerations

The waste characterisations also highlighted that a high portion of the domestic waste stream is composed of mainstream recyclables, 39.2% in MLM. The 2011 National Waste Management Strategy (NWMS) (Department of Environmental Affairs, November 2011) sets a target of 25% diversion of recyclable waste from landfill by 2016. The NWMS is currently under review. The draft 2018 NWMS sets a more ambitious target of 50% diversion of waste in five years (2023) and 80% diversion by 2028.

(a) Tonnage of Mainstream Recyclables Available in the Domestic Waste Stream

Based on the results of the waste characterization and the hypothetical calculations of domestic waste generation, the tonnage of mainstream recyclables being generated in the municipality can be calculated.

A theoretical total of 9,894.04 tonnes of mainstream recyclables (paper, cardboard, plastic, glass, metal) is estimated to be produced by households in the MLM in 2019. A breakdown of the different types of recyclable waste is given in the table below.

Table 27: Theoretical figures of recyclables waste generation rates in Mandeni Local Municipality

Waste category	% of domestic waste stream	Tonnes/ annum
High quality office paper	0.3%	76
Paper other	3.7%	934
Corrugated cardboard	1.5%	379
Non-corrugated cardboard	4.%	1,010
Paper & cardboard subtotal	9.5%	2,398
PET Plastic	3.2%	808
PE-HD Plastic	3.6%	909
PVC Plastic	0.3%	76
PE-LD Plastic	2.8%	707
PP Plastic	2.9%	732
Polystyrene Plastic	0.5%	126
Plastics Other	0.6%	151
Plastics subtotal	13.9%	3,508
Metal	1.8%	454
Glass	14.0%	3,534
Total	**39.2%**	**9,894**

Based on the results of the waste characterisations and hypothetical domestic waste generation rates a significant portion of the waste stream is composed of organic waste and recyclable waste which can be diverted from landfill.

Of interest is that 18.1% of the domestic waste stream in MLM is composed of nappies. There are also currently no municipal drop-off facilities for domestic hazardous waste such as batteries, fluorescent tubes and oil in the municipality.

It must be noted that the waste characterisation undertaken as part of this study only surveyed a small number of households, and were undertaken at one point in time. It is strongly recommended that

additional waste characterizations are undertaken using the methodology presented in this report to build up a more comprehensive data set.

3.4.6 Projected Trends for Domestic Waste Generation and Waste Profiles

Predictions on future waste generation quantities are dependent on population growth and any changes in economic landscape of the MLM. The population size of the MLM increased by 1.55% annually over the last 5 years so it was anticipated that waste generation rates will increase by similar proportions as the population grows. Using the projected population growth, the projected increase in waste generation per waste types have been calculated and is provided in the table below. It must be noted that these figures represent the theoretical amounts of waste generated, and not that which will necessarily be taken to landfill.

Table 28: Projected Amounts of Domestic Waste Generated in 2019 to 2023 in MLM.

Waste category	Composition – Combined Households in 2018. (%)	Projected quantity generated per year in 2019 (tons)	Projected quantity generated per week in 2020 (tons)	Projected quantity generated per week in 2021 (tons)	Projected quantity generated per week in 2022 (tons)	Projected quantity generated per week in 2023(tons)
Paper and cardboard	9.5	2,405.4	2,442.6	2,480.5	2,519.0	2,558.0
Organics	36.7	9,270.6	9,414.3	9,560.2	9,708.4	9,858.9
Plastic	13.9	3,508.3	3,562.7	3,617.9	3674.0	3,731.0
Hazardous	19.5	4,919.3	4,995.5	5,072.9	5,151.6	5231.4
Metals	1.8	461.9	469.0	476.3	483.7	491.2
e-waste	0.3	85.8	87.1	88.5	89.9	91.3
Glass	13.9	3,505.8	3,560.2	3,615.3	3,671.4	3,728.3
Other	3.4	858.2	871.5	885.0	898.7	912.6
Fines	0.9	222.1	225.6	229.0	232.6	236.2
Total	100.0	25,239.9	25,631.1	26,028.4	26,431.8	26,841.5

New industries or changes in business practices will also affect the types and quantity of waste generated, as well as an increase in household and business recycling and composting of organic waste.

3.5 Business Waste Generation

The iSithebe industrial estate which is owned by iThala Development Finance Corporation is a 414 hectare self-contained industrial estate within Mandeni in the MLM. There are approximately 268 tenants (businesses) that are in production within the industrial estate. iThala owns all of the sites within the industrial estate except for 49 privately owned sites. The industrial estate employs approximately 20,000 – 25,000 people. A very large percentage of the business and industrial waste generated in the MLM is generated within the industrial estate as it houses most of the larger industrialised companies within the MLM. The industrial estate provides a waste collection service to some tenants within the estate and other tenants prefer to use other privately owned waste collection companies for the removal of their waste. The MLM does not provide a municipal waste collection service to any of the companies within the industrial estate. The waste service provider appointed by the industrial estate collects waste from some of the companies and transports this to the iSithebe transfer station. The waste is spread across a large concrete floor where recyclable waste is retrieved/ or reclaimed by informal waste pickers and sold to private recycling companies. Thereafter the waste is collected and placed into large skip bins and transported to the Dolphin Coast Landfill Site. All waste generated within the iSithebe industrial estate is disposed of at the Dolphin Coast Landfill Site as it accepts general and hazardous waste.

3.5.1 Vuthela Waste Efficiency Study

The quantities and types of waste generated by businesses within the KLM and MLM were assessed by Triplo4 as part of the Vuthela Waste Efficiency Study (Triplo4, April 2019) which focussed on the ways that waste generated within the KLM and the MLM could be used for job creation through recycling and waste beneficiation projects and activities. The Triplo4 2019 report also considered the results of a Waste Beneficiation Survey undertaken by the Durban University of Technology which considered waste produced by 22 businesses specifically within the iSithebe Industrial park.

During the Triplo4 study, surveys regarding general waste and hazardous waste generation were provided to 220 companies within the KLM and MLM and responses were received from 137 companies, but only 35 companies were willing to participate in the survey. The information received was not separated or presented per municipality and it is assumed that this was done so that the information of participating companies would remain discreet. Nevertheless, the information is provided in this IWMP. Table 30 below summarises the feedback received from companies that formed part of the study.

From the summary of waste generated within the MLM and KLM as part of the Vuthela Waste Efficiency Study it is estimated that the following waste types and tonnages are produced by businesses and industrial companies per month. For the companies that responded to the Triplo4 survey, 80.9 tonnes

of waste are generated per month which is equivalent to 970.8 tonnes of waste per year. Further detail of the waste types and tonnages are provided in Table 30 below.

Table 29: Main Waste Types Produced from 35 Surveyed Companies in the MLM and KLM *(Triplo4, April 2019)*

Waste Type	Waste Generated per month (tonnages)
Paper	5.3
Plastic	60
Tin/cans	2.7
Glass	1
Textile waste	6
Food waste	2.8
Used oil (density of cooking oil used is 920 kg/m^3 used for ±300L)	0.0276
Tyres (average mass of 10 kg per tyre used for 200 units)	2
E-waste	0.003
Scrap metal	0.4
Wood waste	0.06
Fluorescent lights	0.608
Waste per month (tonnes)	**80.9**

Table 30: Waste type and tonnage summary of information received during the Vuthela Waste Efficiency Study for the MLM and the KLM *(Triplo4, April 2019)*

Waste Stream	Quantity (per month)	Generator	Collection	End Disposal/Sink
Paper	± 1,000 kg	Local businesses including industrial parks (based on approx. 27 companies).	Collected by property manager (e.g. Ithala Property Group), private waste collectors (e.g. Dolphin Coast Waste Management - DCWM) and KDM Waste Services	• Landfills i.e. SAPPI landfill in Mandeni. • DCWM separates the waste at a transfer station and sent to Mpact. • KDM transports waste to DCLM landfill
	± 2 000 kg	Factories / mills (based on 2 companies)	Collected by private collection services (e.g. DCWM)	DCWM separates the waste at a transfer station and sent to Mpact.
	± 2 000 kg	Shopping Complexes (based on 3 major shopping complexes in Ballito and Mandeni)	Private waste (e.g. SmartMatta, DCWM, The Reclamation Group and DontWaste) companies collect separated general waste	Recycling plant in eThekwini (e.g. Smart Matta recycling Plant, The Reclamation Group) and DCWM separates the waste at a transfer station and sent to Mpact.
	± 300 kg (per school)	School (based on approx. 10)	PRASA (Paper recycling association of SA) collection	PRASA recycling plant in JHB
	± 8 000 kg of paper per month			
Plastic	± 30 000 kg	Local Businesses including industrial parks (based on approx. 27 companies)	Collected by property manager (e.g. Ithala Property Group, private waste collectors (e.g. DCWM) and KDM Waste Services	• Landfills i.e. SAPPI landfill in Mandeni. • DCWM separates the waste at a transfer station and sent to MO'S in eThekwini
	± 10 000 kg	Factories / mills (based on 2 companies)	Collected by private collection services (e.g. DCWM)	DCWM separates the waste at a transfer station and sent to MO'S in eThekwini
	± 20 000 kg	Shopping Complexes (based on 3 major shopping complexes in Ballito and Mandeni)	Private waste companies collect separated general waste (e.g. DCWM, DontWaste and SmartMatta)	Recycling plant in eThekwini (e.g. Smart Matta or DontWaste recycling Plant) and DCWM separates the waste at a transfer station and sent to MO'S in eThekwini
	± 60,000 kg of plastic per month			

Waste Stream	Quantity (per month)	Generator	Collection	End Disposal/Sink
Tin / cans	± 2,000 kg	Local Businesses including industrial parks (based on approx. 27 companies)	Collected by property manager (e.g. Ithala Property Group), private waste collectors (e.g. Dolphin Coast Waste Management - DCWM) and KDM Waste Services	Landfills i.e. SAPPI landfill in Mandeni.
	± 200 kg	Factories / mills (based on 2 companies)	Collected by private collection services (e.g. DCWM)	DCWM separates the waste at a transfer station and sent to Collect-A-Can in eThekwini
	± 500 kg	Shopping Complexes (based on 3 major shopping complexes in Ballito and Mandeni)	Private waste companies (i.e. SMartMatta, DCWM and DontWaste) collect separate general waste	Recycling plant in eThekwini (e.g. Smart Matta recycling Plant) and DCWM separates the waste at a transfer station and sent to Collect-A-Can in eThekwini
	± 2,700 kg of tin/cans per month			
Glass	± 250 kg	Businesses (based on approx. 27 companies)	Collected by property managers (Ithala Property Group), private waste collectors (e.g. DCWM), informal waste collectors and Municipal Waste Services	• Landfills i.e. SAPPI landfill in Mandeni • DCWM separates the waste at a transfer station and sent to Wasteplan • Informal waste collector ship the glass (must not be damaged or broken) to an unspecified company in JHB
	± 250 kg	Shopping complex (based on 3 major shopping complexes in Ballito and Mandeni)	Private waste companies (e.g. SmartMatta, DCWM and DontWaste) collect separated general waste	Recycling plant in eThekwini (e.g. Smart Matta recycling Plant) and DCWM separates the waste at a transfer station and sent to Wasteplan
	± 500 kg (per school)	Schools (based on approx. 10 schools)	The Glass Recycling Company	Transported to JHB to their recycling plant
	± 5,500 kg of glass per month			
Textile waste	± 4 000 kg	Factories (based on approx. 3 factories)	Left outside the factory for the local community to informally collect if needed. However if the textile waste is not collected by the	• Local community (if informally collected) • DCLM and Mandeni SAPPI Landfill

Waste Stream	Quantity (per month)	Generator	Collection	End Disposal/Sink
			community before the assigned refuse removal day, the excess textile waste is collected by the municipal waste services and taken to a landfill One company in Mandeni send all waste to the SAPPI landfill in Mandeni.	
	± 2 000 kg	Industrial parks	Collected by property manager, Ithala Property Group	DCLM and Mandeni SAPPI Landfill
	± 6 000 kg of textile waste per month			
Food Waste	± 500 kg	Businesses	Collected by municipality waste collectors	DCLM and Mandeni SAPPI Landfill
	± 2 000 kg	Shopping complex	Shopping complexes are currently seeking ways into which food waste can be composted or used reused in some way. The Lifestyle Centre is currently undertaking research in order to find a more eco-friendly was to dispose of their food waste (e.g. a compost heap in the local area). However, until such a sink is found the food waste is disposed via the municipality services or private collection services (DCLM) and Mandeni SAPPI Landfill	DCLM and Mandeni SAPPI Landfill
	± 300 kg	Factories / mills (based on approx. 3 factories)	Dependent on the food product most cooked items are collected by farmers. Uncooked food waste is collected by DCLM	• Used for animal feeds on farms • Uncooked food is disposed of at a landfill (unspecified)
	± 2,800 kg of food waste per month			
Used Oil (mainly used cooking oil and minimal spent oil from petrol filling stations)	± 30 litres	Shopping complexes	Collected by used oil collecting companies such as Oilkol, Spentoil and Rose Foundation	• Some oil collected is sent to the hazardous landfill run by DCLM. • Oil collected by used oil collections companies end sink could not be identified due to a lack of contact. • According to Spent-oil website, After the oil

Waste Stream	Quantity (per month)	Generator	Collection	End Disposal/Sink
				is collected from various outlets, it is graded and sold to various companies where several products can be made, such as paint base, putty, Bio diesel and rubber.
Tyres	± 200 units	Local businesses	Collected by local waste collectors (Informal collectors connected to the Waste Bureau) and transported out of iLembe	Waste Collection depot in Richard's bay, Harrismith and Amanzamtoti. The depot sell them off or remake rubber products (i.e. in Harrismith). NPC – a member of Intercement, buys tyres as a fuel source.
e-waste (excluding data from the recycling plants, such as SIMS)	± 3 kg	Local businesses	From liaison with companies, e-waste is disposed of by themselves.	Disposed of at e-waste recycling plants in Ballito – SIMS and Indalo
Larger (mostly industrial) Scrap Metal (ferrous and non-ferrous)	± 400 kg	Industries	Waste is taken, by mostly larger scrap yards or scrap collectors such as the Reclamation group.	• Scrap metal collected by bigger scrap yards is often taken to yards in eThekwini and sold off or smelted again. • The Reclamation group could not be contacted due to ties with the DUT Commerce study.
Wood Waste	± 60 kg	Industries	Left outside the factory for the local community to informally collect if needed. To date, all wood by-products get collected as this is an easy source of fuel.	Re-used by local community.
Medical waste	No data provided	Medical practices and pharmacies	Private collection companies (i.e. Compass)	The waste is transported to treatment facilities in eThekwini where it is autoclaved, shredded and landfilled. Anatomical, pharmaceutical and cytotoxic waste is incinerated.
Batteries	No data	No data provided by the	Although not allowed, most batteries are disposed of via	• Some types of batteries are exported.

Waste Stream	Quantity (per month)	Generator	Collection	End Disposal/Sink
	provided, but assumed to be Minimal	sampled companies	the standard of general waste disposals. Some batteries go through to the e-waste facilities. Woolworths in Ballito currently holds a station to allow proper disposal of batteries.	• Woolworths send the battering to Nova Lighting. Nova lighting could not be contacted to establish the end sink due to lack of information available online and no feedback from telephonic attempts. • Hirsch's is currently working with the commercial batteries companies (e.g. Duracell or energizer) to recycle batteries collected by Hirsch's. Currently there is no recycling facility for batteries in South Africa. Technology is extremely expensive. Alkaline batteries can go to Hazardous landfill, however non-alkaline are shipped out of SA to Europe or Japan.
Pesticide Containers	2-3 5L containers	Farms	N/A	Most farmers dispose of the containers at the DCLM hazardous landfill site. Smaller farmers allow their workers to use the containers if need be by rinsing out the pesticide residue.
Fluorescent Lights	580 kg	Industrial Business Parks (Ithala Properties)	Collected by unspecified vendor	Disposal site unknown
	28 kg	Mill (based on 1 mill)	Collected by Reclite	Reclite separated the fractions for reuse in other applications
	unknown	Shopping Centre (1 centre)	Collected by DCWM	Goes to DCWM transfer site, and thereafter to Reclite for storage and separation (treatment and recycling done in JHB).

(a) Waste Beneficiation Survey undertaken by the Durban University of Technology

A Waste Beneficiation Survey was undertaken by the Durban University of Technology which provided waste produced by 22 businesses specifically within the iSithebe Industrial Park. Of the 22 companies that responded to the survey undertaken by the DUT, only twelve companies knew the tonnage of generated waste (Triplo4, April 2019). The total waste generated by these companies was 14,213 tonnes per year. The tonnages of some of the individual companies provided in the Vuthela Waste Efficiency Study report are provided below.

- 7,000 tonnes for SAPPI
- 6,000 tonnes for the UN Brewery (main waste type was identified as water with lots of Sodium Hydroxide and husks)
- 752 tonnes for Whilpool – main waste was indicated as metal
- 260 tonnes for Gomma Gomma – main waste type is wood
- 100 tonnes for Atlas timbers – main waste is timber
- 50 tonnes for Web and Sling – main waste is plastic
- 25 tonnes for Freedom Stationers – main waste is paper
- 1 tonnes for Eulinda Engineering, Powertrans – main waste type is metal

The highest generator of waste was SAPPI with 7,000 tonnes of waste per year and the UN Brewery with 6,000 tonnes of waste per year. These two companies represent a 91% (mass basis) of the waste generated within the iSithebe industrial estate of the companies that responded to the survey.

The main waste types generated from input material and business processes by the 22 companies that responded to the survey are indicated in the pie chart below. From the pie chart it is evident that metals and plastics are the most produced as primary wastes by a number of companies followed by textiles and wood.

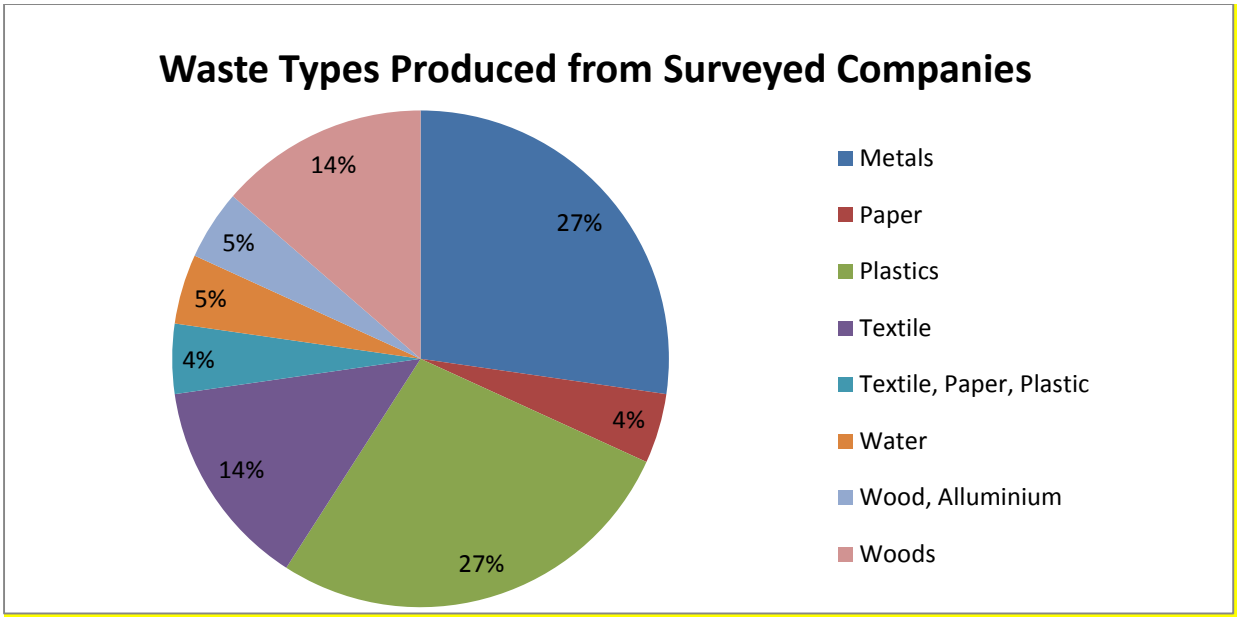


Figure 13: The Main Waste Types Produced from Companies by the DUT *(Triplo4, April 2019)*

3.5.2 Summary of business waste generated within the MLM

Due to the information not being presented per municipality in the Vuthela Waste Efficiency Study which focussed on waste produced by businesses, it is difficult to estimate an amount of waste generated by businesses within the MLM. However, it can be assumed that more than 14,200 tonnes of waste is generated per year by businesses within the MLM. Further studies are required to verify this.

All the waste generated by businesses in the iSithebe industrial park is collected by private waste collection and recycling companies. Nearly all waste collected for general and hazardous waste disposal is disposed of at the Dolphin Coast Landfill Site.

3.6 Waste Recycling

Collecting and sorting recyclable materials is currently dominated by the private sector in the MLM. Several recycling companies are currently operating in MLM, but only one paper recycling programme is currently operated by the municipality.

The municipality has committed in its IDP to commencing with the development of recycling initiatives within the MLM.

3.6.1 Private Recyclers and Business Internal Recycling

The private recyclers engaged with during the development of the IWMP have reported that they interact very seldom with the municipality with regards to their waste operations. Several businesses undertake recycling activities as part of their internal operations. For example, some supermarkets such as Renckens Spar and Spar at the Mandini Mall allow the public to use their recycling bins. Paper recycling is common in offices and schools and the paper is typically collected by a private recycler. Premier Waste and Skyton Recycling Pty Ltd indicated during interviews that recyclables are collected from some businesses and schools in Mandeni.

From interviews with recyclers it is apparent that most are unaware of their obligation to register their facilities in terms of the National Norms and Standards for Storage of waste (GN926 of 2013) and the recently promulgated National Norms and Standards for Sorting, Shredding, Grinding, Crushing, Screening and Baling of Waste (GN1093 of 2017) and the National Standards for Scrapping or Recovery of Motor Mehicles (GN925 of 2013) or reporting in terms of the Waste Information Regulations (GN265 of 2013).

The profiles of the main recycling companies operating in MLM are provided in the table below. Information provided below was provided during interviews with the facility managers. Some managers did not release certain information about their business due to privacy concerns.

Additional information regarding recyclers operating within the MLM was provided by the MLM. Only the names of the private recyclers and types of waste recycled was provided by the MLM. These are indicated by recyclers 6 – 15 in the table below.

Table 31: Private recyclers within MLM business profile

Nr	Name	Years in business	Location of facility	Types of waste accepted	Waste handling activities	Catchment	Challenges	Additional Information
1	Isithebe Industrial Estate Transfer Station	Unknown	Isithebe Industrial Area	All waste types for separation and collection	Waste sorting, storage and bailing	Receives waste from the Isithebe Industrial Area	The overhead structure had burnt down and recyclers are operating without shelters. This means that the workers are exposure to bad weather conditions.	
2	Ozone Friendly Recycling	Not provided		Plastic 150 tons of plastic per month is processed.	Waste sorting, wash and pelletize plastic for export to China and Mozambique	Receives waste from Mpact and Waste Plan. General waste is taken to iSithebe transfer station.	Renting skips from iThala and rates of iThala are too high.	
3	Premier Waste	17 years	23 Yellow Street, Mandeni	Plastic (PET), Cardboard, Metal. On average collects 350 tons of recyclable waste per month.	Waste sorting, storage and bailing	Collecting recyclable waste from the central region of Mandeni. Waste collected from hawkers, waste pickers, small businesses and industries, schools and the community. Supplying to a larger recycling company in Durban. General waste is taken to iThala's transfer station.	Lack of support from the municipality. Municipality could assist by implementing a 2-bag system to separate waste at source and collect household recyclables. The Mandeni tariffs for waste disposal are high and the municipality not collecting waste regularly and waste skips generally reach capacity. Drop-off igloos to be provided for general waste. The waste and recycling facilities are not audited by Province.	Pays informal waste pickers per kg to collect waste.

4	Reclam	Not provided		Steel, non-ferrous and ferrous metals.		Collecting recyclable waste from the Stanger and Mandeni. Waste collected from informal reclaimers, small businesses and industries, schools and the community. Supplying to a larger recycling company in Durban.	The municipality does not put out waste receptacles. It costs R1,500 per load to dispose of waste at the iSithebe transfer station. This rate is more affordable than renting skips	
5	Skyton Recycling Pty Ltd	30 years		Steel, non-ferrous and ferrous metals. Cardboard, paper, plastic (PE-HD, PET, PE-LD). On average collects: 60 tons for bailed (polystryrene and PE-LD plastics), 20 ton scrap metal, 25 ton palletising (PE-LD, PE-HD polystyrene plastics).	Has 20 employees. Waste sorting, storage, baling, grinders, pelletizers. China to supply a machine for processing of plastic similar to a grinder. The only similar machine in South Africa is currently in Durban.	Collects recyclable waste from packaging manufacturers, informal pickers (Ithala transfer station), smaller collectors and schools. Supplying to a larger recycling company in Durban. Used to supply a company in India. Supply recyclables to recyclers based in Mandeni. China stopped receiving recyclables. Ferrous metals are supplied to Group Brick and non-metals supplied to Reclam. General waste is taken to the iSithebe transfer station.	No support received from the municipality. Municipality to assist with provision of colour bags to separate waste at source at households. Once waste is separated, this could be collected by the municipality or private recycler. The people need to be educated on the importance of waste recycling. There is no undercover facility for employees to work. They have explored the possibility of renting an undercover facility, but it is too expensive.	Has a second hand goods licence and a recycling permit received from the police.

6	Hlongwane Pollin	Not provided	B 494 , Ward 13	Bottles				
7	Thembisile Mdletshe	Not provided	B 270, Ward 13	Bottles				
8	Mrs Mpanza	Not provided	Gcaleka Opposite Community Services, Ward 15	Bottles				
9	Dudu F. Mhlongo	Not provided	B 270, Ward 13	Bottles				
10	Mama Mpanza	Not provided	B 94, Ward 14	Bottles, Cardboard, Plastic bottles				
11	Mrs Busisiswe Nzuza	Not provided	B 123, Ward 14	Bottles				
12	Mrs Mtshali	Not provided	B 126, Ward 13	Bottles and tins				
13	Miss Ngonyama	Not provided	B 148, Ward 14	Bottles and tins				
14	C Dlamini	Not provided	A 1027, Ward 07	Bottles and Cardboard				
15	Mrs Manqele	Not provided	B 82, Ward 13	Bottles, cans,				

3.6.2 Recycling co-operatives

The MLM is currently supporting one recycling co-operative where paper and plastic waste recycled in the municipal offices are collected by a private recycler. This is for the collection of recycled paper from the municipal offices. The mass for the paper and plastic recycling are provided in the table below.

Table 32: MLM paper recycling masses from January 2019 to May 2019

Month	Quantity of Paper Recycled	Quantity of Plastic Recycled
January 2019	480 kg	20 kg
February 2019	120 kg	-
March 2019	140 kg	-
April 2019	280 kg	-
May 2019	100 kg	-
Total for 5 months	1120 kg	20 kg
Calculated average per month	224 kg	4 kg

3.6.3 E-waste Recycling

The New Reclamation Group (Reclam) recyclers accept e-waste and has facilities situated in Mandeni. While very little e-waste was found in the domestic waste during the waste characterisation, there is likely to be a significant amount of e-waste generated by the engineering and manufacturing industries.

3.6.4 Hazardous Waste Recycling

The recycling of hazardous waste is relatively limited in the province, likely due to the costs involved in the processes required, the low quantities of waste involved, and the low demand for the recycled product.

3.6.5 Waste reduction initiatives

There are currently no waste reduction initiatives being operated by the MLM. There are also no initiatives from the MLM to encourage people to reduce the generation of waste. The MLM does not operate facilities such as a material recovery facility (MRF), a buy-back centre, recyclable drop off centre or a composting facility and does not operate any two-bag separation at source programmes. In-house paper recycling is undertaken at the Mandeni municipal offices.

3.6.6 Recycling Tonnages

According to SAWIS (Department of Environmental Affairs, 2018), metals, paper and plastic are recycled within the MLM. The tonnages from 2013 to 2018 for the materials recycled within the MLM are provided in the table below.

Table 33: Quantities (tonnes) of materials recycled within the MLM. Date sourced from SAWIS (Department of Environmental Affairs, 2018)

Recyclable Type	2013	2014	2015	2016	2017	2018
Commercial and industrial waste	107,059.60	86,572.5	67,211.3	4,525.0	6,149.0	
Ferrous metal		5,723.1	4007.5			2354.3
Non-ferrous metal		348	236.7			227.3
Paper				60 013.0	68 006.0	54 938.6
Plastic (Disestablished)						10.2
Total	107,059.6	92,643.6	71,455.5	4,525.0	6,149.0	57,530.4

The main recyclable waste types collected within the MLM as indicated during interviews and according to Table 30 and Table 31 are summarised below:

- Commercial industrial wastes
- Mainly plastics (PE-HD, PET, PE-LD)
- Cardboard
- Metals; ferrous and non-ferrous metals

3.7 Waste Collection and Transportation

3.7.1 Domestic, Business and Industry Refuse Removal

The MLM provides a kerb side, weekly collection service to registered households within urban areas of Mandeni, Sundumbili, Tugela Rail, Pardianagar, High View Park and Tugela Mouth (IMQS, 2019). Waste is collected from businesses weekly mainly in Mandeni in the MLM as well. Businesses and registered non-residentials receive a weekly waste collection service and can receive a more frequent waste collection service on request. The Renckens Spar business area currently receives a collection service six days a week. Waste is removed from schools, hospitals and other public amenities once weekly. However, large industrial companies in the area make use of private service providers (IMQS, 2019).

The municipality provides the residents and businesses with 10 black bags per month for the disposal of waste. On the designated day of waste collection, residents place their black bags outside their homes on the road verge for waste collection.

Collection of waste from the Renckens Spar Centre occurs behind the Spar building within a demarcated waste storage area allocated as an enclosed loading dock. The surrounding businesses utilise this waste storage area as well to dispose of their waste for collection by the MLM.

As indicated in the tables below, community facilities such as schools, clinics, community halls, parks, recreational beach areas and community halls also receive a waste collection service. Black bags or waste bins are provided to these facilities.

The MLM collects waste from rural areas where a door-to-door waste collection service is not provided with a communal skip system where skips are placed within walking distance from residents. The collection of waste from these skips varies from weekly to once every two weeks. The MLM use a 10-ton compactor truck, rear-end loader, which is equipped with a winch system to empty skips. The waste in the skips are emptied directly into the compactor and do not have to be removed. While the coverage area of skips is good in the peri-urban areas, the skip placement is more of a challenge in the rural areas where houses are distributed across large areas in low densities and access to these households are limited due to poor road conditions (IMQS, 2019). Skip coverage in such areas is generally poor.

Once waste is collected by the compactor trucks it is taken to the King Cetshwayo District Municipality regional landfill site. The following table provides a detailed breakdown of the collection service provided in the MLM.

Table 34: Refuse removal schedule for areas within the MLM (provided by waste supervisor)

Place	Ward	Waste collection day	Frequency of refuse collection	
			6 days a week	1 day a week
Renckens Spar business hub/area	7	Monday - Saturday	X	
Tugela Mouth Village North bound	2	Monday		X
Dark City , Qhib'khowe and Majuba	7	Monday		X
Bhidla, Gcaleka and Thokoza	15	Monday		X
Ireland, White City and Red Hill	13	Tuesday		X

Chappies and Skhalambazo	14	Tuesday		X
Mandeni and Sappi Village	3	Wednesday		X
Khenan Area	10	Wednesday		X
Tugela, Tugela Mouth Village South bound, Newark and Newtown	3	Thursday		X
Padianagar, Emathankeni, Ehholo, Sphekephekeni, Eblokisin, Ezinsimbini and Novis Farm	4	Thursday		X
Businesses and skips	1,2,3,5,8,9 10,11,12, 16,17 and 18	Friday		X
Ndulinde Clinic Ndulinde Library	6 and 7	Friday		X
Dokodweni beach ,Tugela Mouth beach	1, 2 and 7	Saturday		X

A list of all businesses receiving a waste collection service within the MLM is provided below. The frequency of waste collection per business was not provided by the MLM, however from the waste collection route schedule provided, it was noted that Renckens Spar and business area is serviced 6 days a week from Monday to Saturday. According to the business collection registers from February to June 2019 all businesses do not receive a weekly waste collection service; however, waste is collected on a regular basis from all businesses.

Table 35: Businesses and community facilities receiving a waste collection service from the MLM (provided by waste supervisor)

Business Name	Business Name	Business Name
Busy Corner	Masakhane Properties (Sec B)	Speedy Auto Parts (A 837)
Dokodweni Clinic	Methar (58 Tugela)	Sundumbili Clinic
Dr Thabethe	Mzomuhle Creche	Sundumbili Primary
Ethel Mthiyane Sp Sch	Ndulinde Clinic	Sundumbili Supermarket(A837)
E Valley Shop (Lot 27)	Nkwazi Camp	Thandanani Pre School
Fort Person Nature Reserve	Ohwebede Clinic	Thekwini Sausages (A 837)
Hlomendlini Clinic	Phola Park	Thokoza Lounge
Ikhwezi C Centre	Police Station Newark	Thokoza Tavern
Ikusasa Lemfndo Creche	Police Station Mnd	Thukela Sec School
Ilembe Sundumbili Offices	Police Station Sun	Tugela Central Store

Impoqabulungu Sec	Post Office Mnd	Tugela High School
Isithebe Clinic	Primla Clothing (Tugela)	Tugela Mouth Lobotes
Ithala Mini Factories	Renckens Hyper Store	Tugela Mouth (Lot 22)
Khayalemfundo Primary S	River View Service Station	Tugela Mouth Resort
Khululeka Bottle Store	Shopping Centre Mnd	Ubuhlebesundumbili
Lalanathi G House	Shoprite Mandeni Mall	Udumo High School
Love Life Youth Centre	Sipho's Tavern	Umfolozi College Mnd
Lower Tugela Primary	Siyavikelwa Primary S	Umfolozi College Sun
Mandeni Academy	Social Development Office	Wangu Clinic
Mandeni Club	Social Tavern	Yenzokuhle Creche
Mandeni Pre School	Social Welfare	Zamimpilo Butchery
Mandeni Motors	Sondoni Butchery	

A list of the number of waste skips that are placed in each ward is provided below. During interviews with waste management staff, they advised that waste from skips are collected weekly or once every two weeks. These were dependent mainly on the availability of waste collection vehicles to collect this waste. According to the information provided, a total of 108 skips are placed within the MLM and receive a waste collection service from the MLM. Of these 108 skips, 13 are worn out and are to be replaced within 2019 as the municipality has budgeted to purchase an additional 30 skips. The 13 skips would therefore be replaced and 17 skips will be used to expand the waste collection service. The municipality would then have a total of 125 skips placed throughout the MLM. A map of the placement of skips within the MLM is provided in the Figure 14.

The waste management staff indicated that the disposal of waste into waste skips is working well in some areas, but in some areas waste is still being dumped or burnt at communal dump sites. At times waste is dumped next to the waste skip due to people, mainly children, not being able to lift the waste bags into the waste skip. The burning of waste within the skip bin and next to the skip bin was also noted during site visits.

Table 36: The number of waste skips per ward that receive a waste collection service (provided by waste supervisor)

WARD NUMBER	NUMBER OF SKIPS
Ward 1	4
Ward 2	4
Ward 3	3
Ward 4	19

Ward 5	1
Ward 6	3
Ward 7	5
Ward 8	7
Ward 9	5
Ward 10	14
Ward 11	1
Ward 12	8
Ward 13	0
Ward 14	0
Ward 15	0
Ward 16	5
Ward 17	16
Ward 18	13
GRAND TOTAL	**108**

Ward No	Skips within Ward
1	4
2	5
3	2
4	20
5	6
6	8
7	2
8	9
9	6
10	6
11	3
12	7
13	2
14	0
15	2
16	12
17	8
18	8

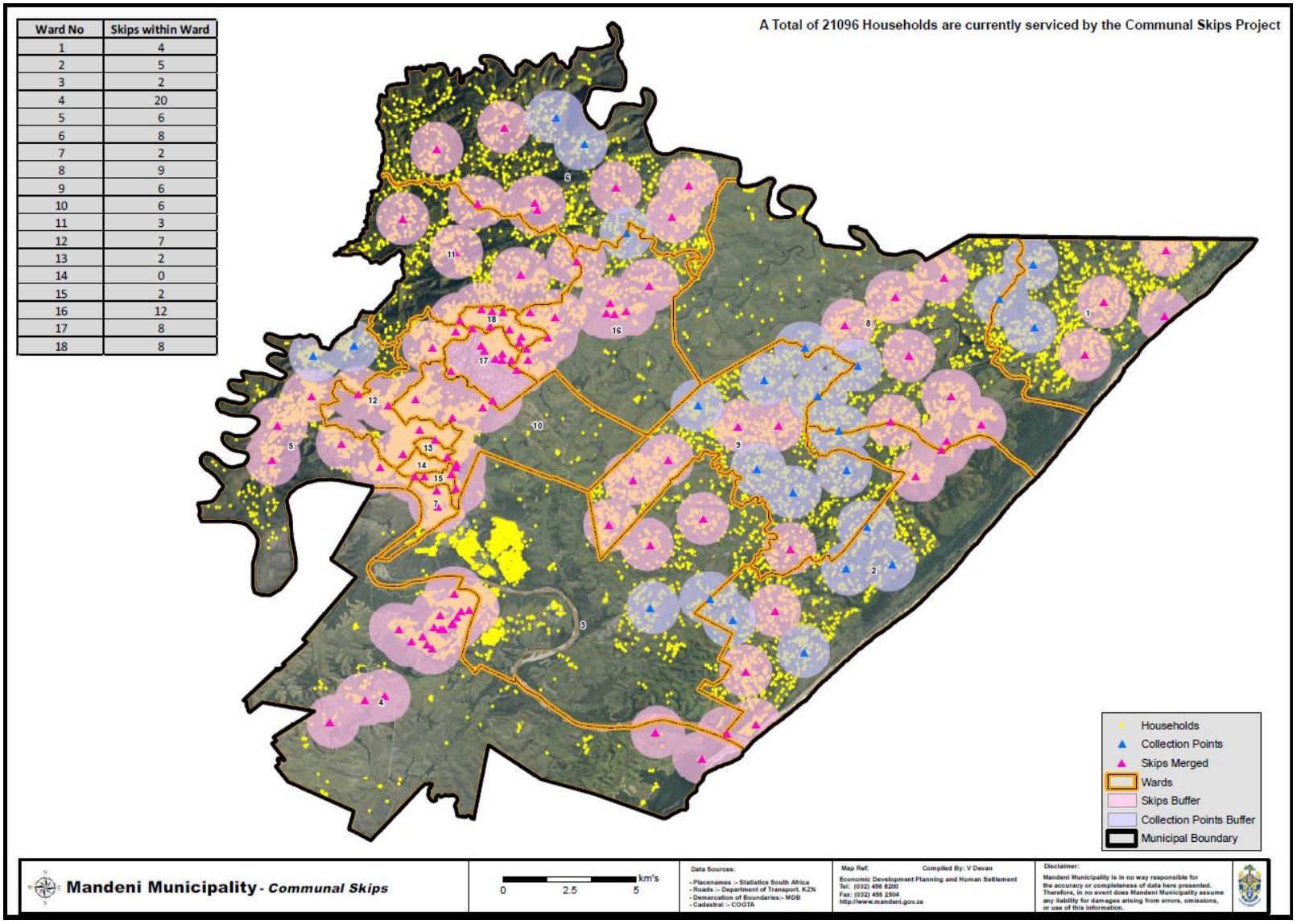


Figure 14: The Mandeni LM Skip Placement Map

3.7.2 **Waste Management Fleet**

The MLM waste management fleet is managed by the Community Services Department. Details of the waste collection fleet are presented in the table below.

Table 37: MLM Waste Collection Fleet

No.	Type Of Vehicle	Model	Registration	Years	Area Serviced	Current Condition
1.	Compactor Truck	UD 330	NZ 10679	2015 - present	Collects refuse in all municipal wards	Good
2.	Compactor Truck	UD 330	NZ 11077	2015 - present	Collects refuse in all municipal wards	Good
2.	Compactor Truck	Mercedes Benz Axor 2628	HMS 328 MP	2015 - present	Collects refuse in all municipal wards	Good
4.	Small utility vehicle ("Bakkie")	Isuzu KB 250D	NZ 19103	2012	Used to transport staff, goods and minor amounts of waste where applicable	Good

The condition of the fleet in MLM is good and most of the vehicles are fairly new. The current fleet is able to provide a regular collection service to residential, rural and businesses areas that currently receive a waste collection service. The waste collection vehicles are also able to collect waste from the skip bins. Additional vehicles are however required to ensure sufficient backup vehicles are available in case of breakdowns and to extend the waste collection service to rural areas that currently do not receive a waste collection service. At present there is no vehicle replacement plan in place. Such a plan should include a matrix for rating vehicles in terms of priority for replacement. Criteria to be used would include age of the vehicles, mileage, maintenance costs, running costs etc.

The waste management department utilises the TLB and tipper truck from the technical department on a haphazard basis to collect dumped waste from illegal dumping sites in the municipal area.

Figure 15: Compactor trucks in use by the MLM for waste collection

3.7.3 Transfer Stations

(a) The Mandeni Transfer Station:

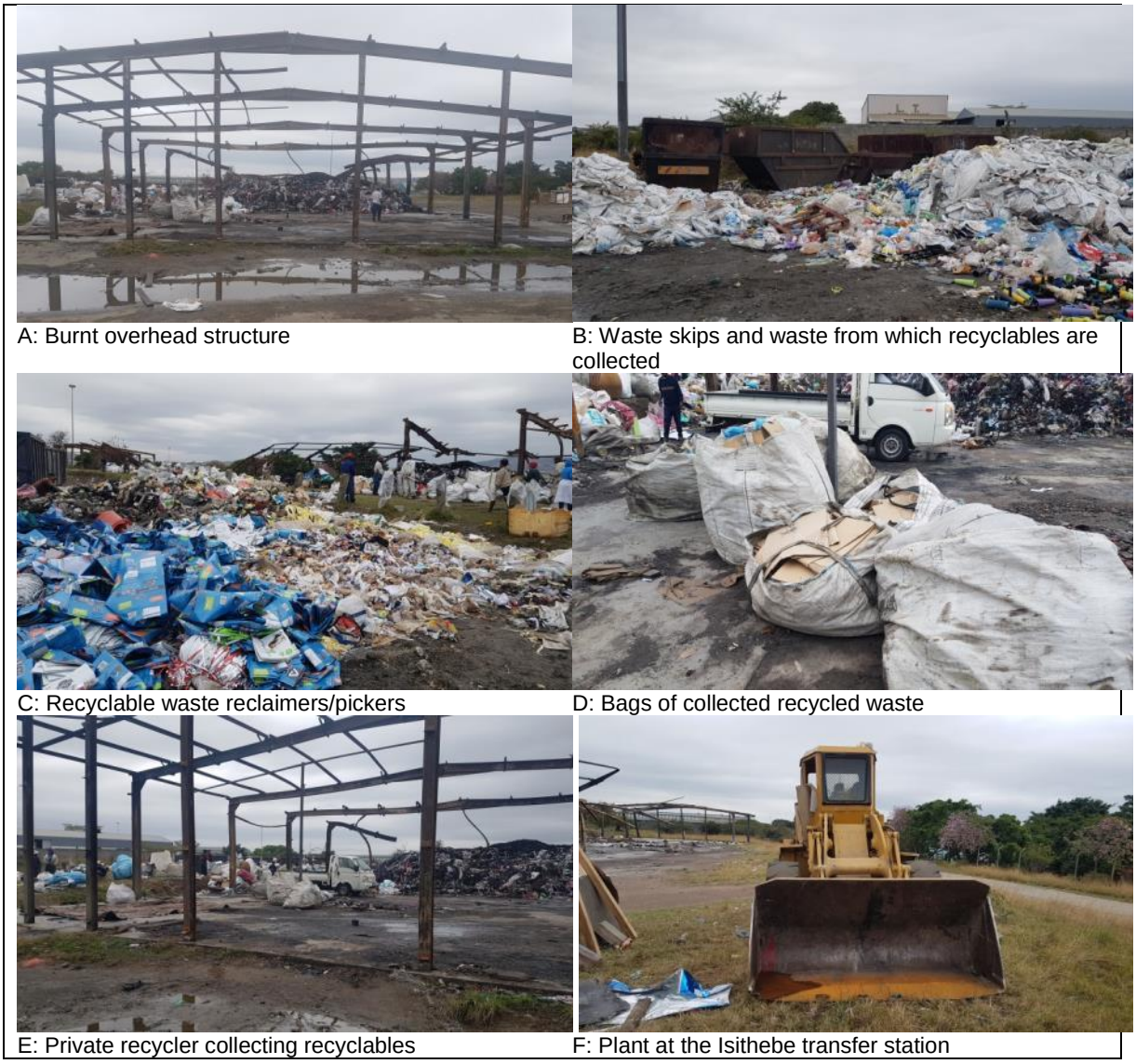
A transfer station was located at the Mandeni sewage works, but it is no longer in use and closed. The transfer station was developed to receive and store waste which would be collected on a daily basis by Dolphin Coast Waste Management (DCWM). The facility received environmental approval from the Kwa-Zulu Natal Department of Agriculture, Environmental Affairs and Rural Development (DAEARD) (now known as the Kwa-Zulu Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA)) on 26 March 2003 on condition that the facility is operated in accordance to the operating procedure (which DCWM had included in their letter of application for approval). DCWM was the permit holder for the transfer station. The environmental approval stipulated that no waste was to be stored at the premises overnight and that all waste is removed from the facility before the close of the work shift. However, noted during a site visit in 2008, the operations of the facility were not compliant with the environmental authorisation conditions (GIBB Engineering and Science, 2009).

The transfer station consisted of a hard standing area and an associated leachate collection sump from where the leachate was pumped to the sewage treatment works. This ensured that the facility had negligible impacts on the environment (GIBB Engineering and Science, 2009).

At the time of construction of the transfer station and operation of the transfer station, DCWM was appointed by the MLM to collect their domestic waste within the municipal area. It is assumed that when the MLM discontinued to use DCWM to conduct their waste collection and appointed another service provider to collect, transport and dispose of their waste, that DCWM discontinued their operations at this transfer station.

(b) The iSithebe Transfer Station:

The iSithebe Industrial Estate owns and operates its own transfer station and transfer station. General waste is collected within the Industrial Estate using skip trucks. The waste is transported to the transfer station where recyclable waste is collected by informal reclaimers. Waste that is not recycled, is temporarily stored in several large skip bins until it is collected and transported to the Dolphin Coast landfill site in the KwaDukuza Local municipality. The recycled waste is purchased directly from these informal reclaimers by recycling companies. A covered area was constructed for the reclaimers to separate the recyclable waste from the waste stored at the transfer station, however this had burnt down. The site is currently not operating within in permit requirements.



A: Burnt overhead structure

B: Waste skips and waste from which recyclables are collected

C: Recyclable waste reclaimers/pickers

D: Bags of collected recycled waste

E: Private recycler collecting recyclables

F: Plant at the Isithebe transfer station

Figure 16: The iSithebe Transfer Station

3.7.4 Waste Treatment and Disposal

(a) Treatment

There are no waste treatment facilities in the MLM. The closest waste treatment facility is the hazardous waste treatment facility located at the Dolphin Coast Landfill in the KwaDukuza Local Municipality. The treatment facility is permitted and can accept hazardous solid waste, effluent, wastewater and sewerage.

According to the South African Waste Information Centre (Department of Environmental Affairs, 2018) there is no information specific to the MLM for the treatment of waste or waste treated from the MLM. There was only information available for waste generated in the MLM, but treated in another local municipality. The South African Waste Information Centre reports that 324.8 tonnes of Health Care risk waste and 37.8 tonnes of liquid and sludge inorganic waste from the iLembe District Municipality is treated.

(b) Composting

There is no municipal composting facility in the MLM. The MLM Parks and Gardens department collects garden waste from residents and clients on request. The MLM disposed of garden waste at a privately owned compositing site between 2012 and 2018, but stopped this in 2018 at the request of the landowner. Since August 2018, the MLM has made use of privately owned garden waste composters and a privately owned vegetable garden to accept the green waste collected in the MLM.

The supervisor for the Parks and Gardens department anticipates that the MLM will have a problem with the disposal of green waste should these private facilities no longer accept municipal waste as the department has appointed contractors for grass cutting within the MLM, but with no guaranteed area to dispose of the cut grass. According to the superintendent of the Parks and Gardens department, a short term solution is to obtain a small wood chipper for the composting of garden waste which would be undertaken and operated by the Parks and Gardens department. This would also divert this waste away from a landfill site or dump site.

Additional staff, plant and equipment are required as well to provide an adequate garden waste collection and handling service, and to ensure that the garden waste is composted correctly or provided to a privately owned garden waste composter or plant nursery.

From a legal compliance and best-practice perspective, municipal composting facilities should be considered, even if the management thereof is outsourced and subsidised. The Norms and Standards for Disposal of Waste to Landfill (GN 636 of 2013) require that all municipalities should divert 25% of

their garden waste from landfill by 2018 and divert 50% of their garden waste from landfill by 2023 (DEA, 2013). By using the collected waste figures from 2015 for the MLM (8,000 tonnes per annum), and the percentage of garden waste noted in the domestic waste stream as per the waste characterisation (6.44%); approximately 515 tonnes of garden waste should have been diverted from landfill preferably for composting by 2018, and 1,030 tonnes of waste should be diverted from landfill by 2023. The MLM should plan to provide sufficient capacity at waste drop off centres for a projected 1030 tonnes garden waste per year in 2023, as well as composting facilities where this garden refuse can be processed.

3.7.5 Landfill and Waste Disposal Sites

The MLM does not own nor operate any landfill sites. The only operational landfill site in the Mandeni municipal area is the privately owned Sappi Tugela Landfill site (GLB+) in Mandeni. The Isithebe Industrial Estate had a privately operated landfill site, which the MLM previously used for waste disposal, but this landfill was closed when it reached capacity. The site has been formally closed and rehabilitated. The MLM also previously used the Dolphin Coast Landfill Site in the neighbouring KwaDukuza Local Municipality, but currently utilises the King Cetshwayo District regional landfill site located outside Richards Bay in the Umhlathuze municipality and operated by King Cetshwayo District Municipality for the disposal of their collected domestic waste. The subsection below provides a brief description of these landfill sites and their current legal status. Details of the Dolphin Coast Landfill Site is included below as a large percentage of the business and industrial waste generated within the MLM is disposed of at Dolphin Coast Landfill Site.

(a) Sappi Tugela Landfill

The Sappi Tugela Landfill is a permitted GLB+ landfill (general waste large landfill which produces leachate) on Farm 15641 of Farm Sisalana in Mandeni. Phases 1 – 4 of the site are lined to conform to the Minimum Requirements for Waste Disposal by Landfill (1998). Phase 5 has a class A liner. The site is managed in-house by Sappi. The site reached its capacity in 2003. Sappi thereafter lodged an application for the extension of the site. The permit was granted and the landfill site has been extended. The reference number for the licence is CD29/WML/0003/10. The site is used for disposal of waste from the Sappi Tugela mill and a portion of waste from external sources is accepted to improve the mix of the waste. A total of 50% of the waste to the landfill site is from Sappi, and the other 50% from external sources. The landfill site has 50 years of airspace available based on the current volumes.

The Sappi landfill site previously accepted waste from the MLM, but the MLM indicated that they have not used the Sappi landfill site because disposal charges were too high. A memorandum of understating (MOU) detailed that a waste management agreement was entered into by the MLM and Sappi, where

it was agreed that the municipality was allowed to dispose of general waste at the landfill site. However, the municipality could not guarantee that only general waste would be disposed of at the landfill site, as domestic hazardous waste, dangerous or pollutant substances would enter the waste stream from time to time. This along with the expensive disposal costs was the reasons the MLM stopped disposing domestic waste at the landfill site.

(b) iSithebe Industrial Estate Landfill

The Isithebe Industrial Estate landfill site reached capacity in 2009 and has been formally closed and rehabilitated. The landfill site was permitted as a class A landfill under the DWAF permit status (Arcuss GIBB, 2009). Isithebe Industrial Estate now make use of a service provider to remove their waste.

(c) King Cetshwayo District Regional Landfill

Domestic waste collected within the MLM is transported and disposed of at the King Cetshawayo Landfill site which is located outside Richards Bay in the Umhlathuze municipality and operated by King Cetshwayo District Municipality (formerly known as the uThungulu District Municipality). The landfill site is approximately 80 km from the MLM. It is Class A landfill site, but it is permitted as a general landfill site (GMB+) and is permitted (permit number 16/2/7/W1/D1/Z1/P485). It has remaining airspace for approximately 30 years (uThungulu District Municipality, 2013). However according to the MLM Asset Management Plan, the King Cetshawayo regional landfill site has approximately 5 years airspace left in the cell in use at the landfill and has commenced with preliminary designs for a new cell in 2018. The MLM should remain cognisant of this and should consider the development of local municipal landfill site or the use of another landfill site. A project for the investigation of the local municipal landfill would only be undertaken should the regional landfill site be discarded (IMQS, 2019).

(d) The Dolphin Coast Landfill

The KwaDukuza Waste Treatment and Disposal Facility: Leachate Treatment Facility, commonly known as the Dolphin Coast Landfill site is located in Stanger within the neighbouring KwaDukuza Local Municipality and is a privately owned and managed landfill. The landfill site is located on portion 19 of the farm New Guelderland no. 1404 and portion 25 of the farm New Guelderland. The landfill has operated since July 2007 and is a H:H landfill with permit number 12/9/11/L770/4/R1. The site is permitted to accept both general and hazardous waste.

(e) Future planning for iLembe Regional Waste Disposal Site

As part of the waste planning for the MLM, the iLembe District Municipality has considered establishing a regional landfill site that will accept waste generated in the district municipality which includes the MLM. There are no additional future plans by the MLM to establish a landfill site within the MLM area.

3.7.6 SAWIC Tonnages

The waste disposal tonnages for MLM, as per the SAWIC website, are provided in the table below.

Table 38: Waste disposal tonnages for the MLM as per SAWIC (Department of Environmental Affairs, 2018)

Year	Tonnes disposed (general and commercial)
2018	113,519 tonnes
2017	149,234 tonnes
2016	129,378 tonnes
2015	108,237 tonnes
2014	97,051 tonnes
2013	110,469 tonnes
2012	101,867 tonnes

The MLM indicated that they are not currently reporting any waste disposal tonnages to SAWIC. The iLembe District waste representative advised that the King Cetshwayo regional landfill site is reporting the above data on behalf of the MLM.

The SAWIC provides a facility for local municipalities and private organisations alike to record and report on hazardous waste generated and disposed of. The system is not well utilized at present. While hazardous waste contractors record the volumes of wastes handled and disposed, this information is not being collated, and details regarding the source of the hazardous waste e.g. from which municipality it originates, is not available. Awareness about the SAWIC should be increased amongst industries in the area.

3.7.7 Hazardous and Health Care Risk Waste Disposal

Hazardous waste is defined by the National Environmental Management Waste Act (NEMWA) as 'Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health

and the environment'. Hazardous waste commonly found in the domestic waste stream includes fluorescent light bulbs, batteries, chemicals and paints.

Animal carcasses are a form of infectious waste that is produced by abattoirs. National Standards for the Disposal of Waste to Landfill (DEA, 2013) prohibits infectious and animal carcass waste from being disposed to landfill.

Health care risk waste is waste that contains infectious agents, sharps, hazardous chemicals or pharmaceuticals, or is genotoxic or radioactive. Needles and medication are all classified as HCRW and are generally found as part of the domestic waste stream.

The main producers of HCRW in the MLM are:

- Sundumbili Community Health Care
- Endulinde clinic
- Ohwebede cinic
- Amatikulu Primary health care centre
- Macambini clinic
- Hlomendlini clinic
- Mandeni clinic
- Isithebe clinic

Hazardous and HCRW care risk should be treated and then disposed of at a hazardous landfill site or a general site if delisted. Provincial health care facilities in MLM are serviced by Compass Waste who collect HCRW and treats it at their autoclave facility in Durban.

The management of hazardous and health care risk waste does not fall within the ambit of the Local Municipality's responsibility but sits rather with Provincial Government. The local municipality however has a role in reporting mismanagement of hazardous waste.

Health care risk waste generated by government health care facilities in the iLembe District is managed through the Department of Health (DoH). The DoH has contracts in place with Compass Waste for the management of HCRW. These are for the supply of consumables and the collection, transportation, treatment and disposal of HCRW from clinics, community health centres and hospitals (DoH, 2015).

The South African Waste Information Centre (SAWIC) does not hold any Health Care Risk Waste data for the MLM.

3.8 By-law Enforcement and Illegal Dumping and Littering

3.8.1 Illegal dumping

The MLM senior waste managers have indicated that illegal dumping is a significant problem in and around the rural township areas within the MLM due to the waste collection service not being conducted in these areas. The location of the most common and largest illegal dumping hotspots was surveyed by the MLM in 2018, and details are presented in the table and figure below.

Table 39: Location and GPS coordinates of illegal dumping hotspots in the MLM (provided by MLM waste supervisor)

SITE	LOCATION
Along R102 before Tugela River Main bridge	Lat: 29° 9' 58.43" S; Long 31° 24' 58.43" E
Along R102, Heading North from Total Garage (from Mandeni side direction)	Lat: 29° 9' 38.35" S; Long 31° 27' 6.09" E
In Kwasithebe Area by the 7th day Church	Lat: 29° 5' 20.53" S; Long 31° 25' 55.62" E
In Kwasithebe Area on open space between two Ndimande skips	Lat: 29° 5' 54.76" S; Long 31° 25' 27.69" E
Island corner of Yenzokuhle Creche and Siyavikelwa School, Sundumbili	Lat: 29° 7' 34.20" S; Long 31° 23' 50.96" E
End of the King Fisher Road, Mandeni	Lat: 29° 9' 38.12" S; Long 31° 25' 24.82" E
In Ward 13, Ward 14, P459 and P415	Coordinates not provided

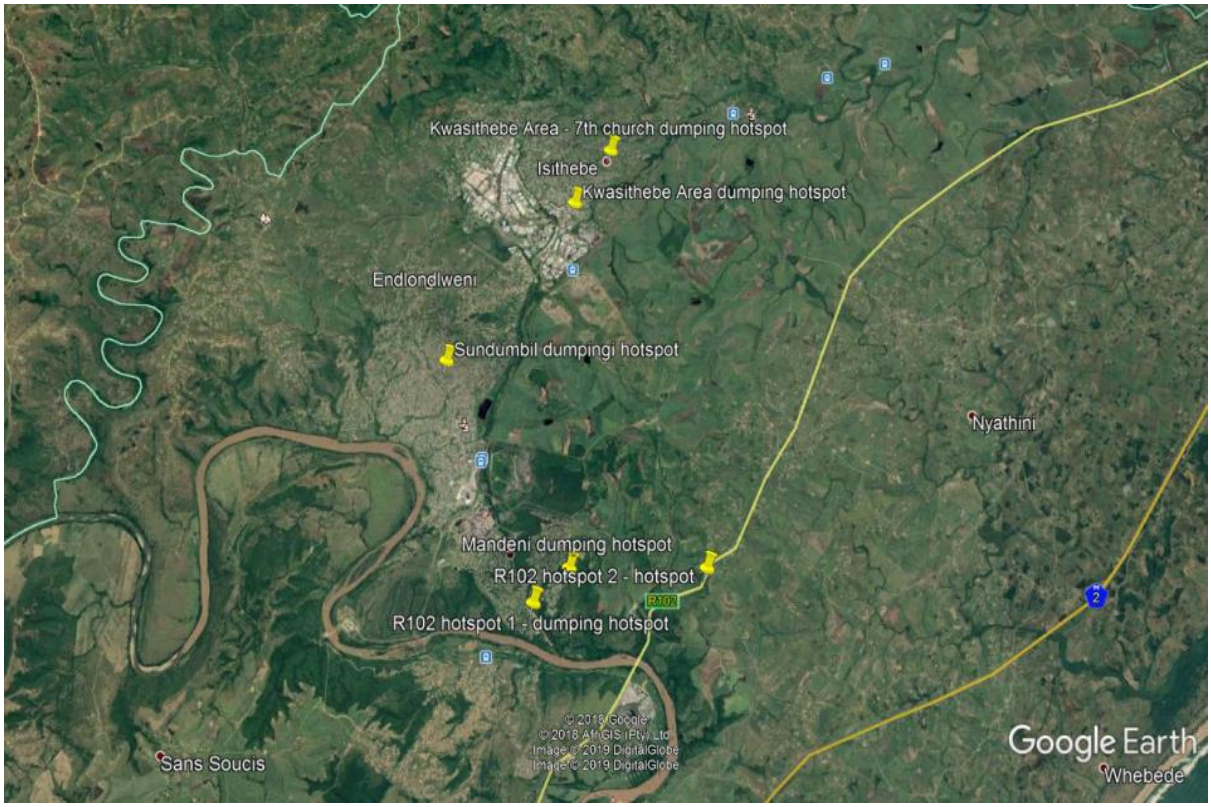


Figure 17: Illegal dumping hotspots in the Mandeni Local Municipality

During staff interviews it was reported that the main causes for illegal dumping were as follows:

- There are no landfill sites or transfer stations within the MLM where the communities and businesses (including construction-related businesses) can take their waste to for disposal.
- The nearest landfill sites (Dolphin Coast landfill and the King Cetshwayo regional landfill sites) that will accept domestic waste are far removed from Mandeni. The Dolphin Coast landfill is approximately 30 km south-wets of Mandeni and the King Cetshwayo regional landfill site is 70 km north-east of Mandeni.
- There are insufficient waste bins and communal skips within the MLM therefore communities have nowhere to dispose of their waste.
- The MLM does not provide a waste collection service to all peri-urban and rural areas.
- The MLM does not have dedicated waste enforcement staff to patrol open spaces and issue fines for dumping.
- Dumping incidents are not reported by the community to the municipality.

3.8.2 **Littering**

Litter pickers (also called street sweepers) are utilised by the municipality through the Food for Waste programme to clean town centres and furrows. The frequency of litter removal by the litter pickers varied between towns. In the larger, more urban towns such as Mandeni, Sundumbili, and Tugela, the streets

are cleaned daily and in the smaller, more rural towns within the MLM the streets are cleaned infrequently. The Food for Waste Programme had stopped in 2018 and no workers of the temporary programme were employed as litter pickers on a permanent basis by the MLM.

The following main reasons for littering were suggested by waste management staff as:

- The community is not educated on the correct manner to dispose of waste
- There is no waste collection services or landfill sites in rural areas
- Insufficient funding for street side bins and waste skips
- Scavenging from bins and black bags put out for collection
- The public burn waste in communal skips
- Business owners do not have adequate waste storage facilities and put waste out at all times of the day
- Lack of enforcement of by-laws.

3.8.3 By-law Enforcement

The waste management by-laws for the MLM were gazetted in 2010 and are comprehensive. The by-laws include sections on littering, dumping, offences and penalties; however, staff of the waste management department indicated that there are no compliance and enforcement staff to act as waste rangers.

3.9 Waste Management Institutional Functioning

3.9.1 Waste Management Staff

The current (June 2019) structure of the waste management sub-directorate of the MLM is shown in the organogram below which is the official and approved organogram for the department. There is currently no Waste Management Officer that is appointed within the MLM. The Director of Community Services or the Waste Manager are generally positions within the waste department that hold this title and perform this function within LMs. The current vacancies of the organogram is the 9 litter pickers. The MLM proposes to fill these positions within in 2019/2020 financial year.

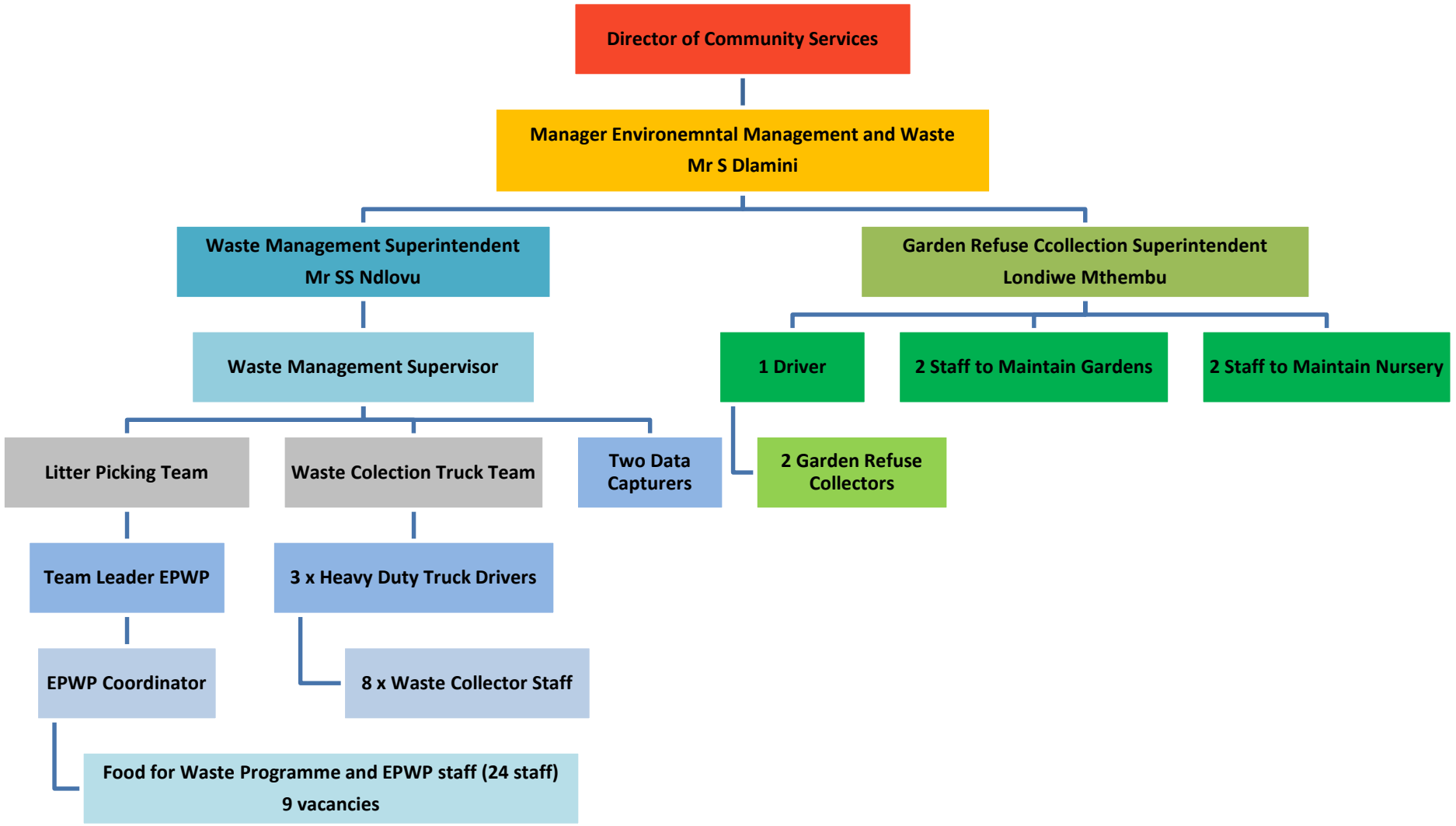


Figure 18: Mandeni Local Municipality Waste Department Organogram

3.9.2 Economic and Finances

The MLM is required to budget and provide finances for waste management services. Traditionally and in general, the provision of waste collection and disposal services provided by municipalities has been under-funded. This situation has been aggravated in recent years by changes in legislation which place increasingly demanding requirements on municipalities (provision of recycling facilities, weekly refuse collection services etc.), as well as higher costs of provision of plant and equipment and development of waste management facilities. These increases often outstrip the rate at which tariffs or rates can be increased. A further factor which negatively impacts on funding of waste management services is that much of the funding available (Equitable Share) has been diverted to other social areas (e.g. housing). It is thus challenging for municipalities to fund the provision of waste services and equally challenging to introduce or increase tariffs to the necessary levels.

According to the Mandeni IDP 2017, solid waste removal is operating at a surplus and sufficient funds are available for the waste collection service. For 2017, the projected revenue for solid waste was R 8.4 million for billing of debtors and R 5 million from the equitable share for indigent households. The total revenue was therefore R 13.4 million (Mandeni Local Municipality, 2017).

The total projected expenditure for waste collection was R4 million which was made up of R1.8 million for the waste compactors and employee costs of R 2.1 million and free basic services of R100 000. The MLM therefore has a surplus of funds for the provision of waste collection according to the 2017 IDP. A breakdown of the revenue and expenditure as per the Annual Financial Statements for the MLM is presented in the table below for the past five years.

Table 40: Annual revenue and expenditure for waste management in the MLM (MLM Annual Financial Statements 2013/2014 – 2017/2018).

Financial Year	Revenue (Tariff + ES)	Expenditure	Difference	Surplus/Deficit
2017/2018	R 13,395 481.96	R 4 372 024.20	R 9 023 457.76	Surplus
2016/2017	R 12 920 265.94	R 8 179 991.20	R 4 740 274.74	Surplus
2015/2016	R 11 943 110.00	R 8 997 992.37	R 2 945 117.63	Surplus
2014/2015	R 11 550 107.00	R 5 858 390.56	R 5 691 716.44	Surplus
2013/2014	R 10 387 263.00	R 11 919 370.00	-R1 532 107.00	Deficit

The approved waste management expenditure budget and projected revenue detailed in the Mandeni IDP (Mandeni Local Municipality, 2017) have been provided in the table below.

Table 41: Mandeni LM Waste Management Approved Funding for Waste Projects (Mandeni Local Municipality, 2017)

Waste Management	Funding Source	2017/18 CPI 6.4%	2018/19 CPI 5.7%	2019/20 CPI 5.6%
Community services				
Food for waste programme	MLM	R 1 000 000		
Waste Management				
Procurement of PPE for contacted waste management staff	MLM	R 50 000	R53,000	R 56,180
Procurement of EPWP tools and equipment	EPWP	-	R212,000	R224,720
Procurement of PPE for EPWP beneficiaries	WPWP	-	R159,000	R168,540
Acquisition and rehabilitation of the Isithebe Waste Transfer Station		-	R3,000,000	R3,180,000
Parks and Gardens				
Grass cutting in various areas and sports fields around Mandeni (Wards 2,3,4,5,6,7,8,13,14,15)	MLM	R3,500,000	R4,240,000	R4,494,000
Greening and Beautification of Municipal Infrastructure (All wards)	MLM/EDTEA	R,300,000	R,530,000	R561,800
Planning Projects				
Environmental Awareness Programme (in all wards)	MLM (Equitable Share)	R 30 000.00	R 130 000.00	

(a) Mandeni Local Municipality Asset Management Plan, Sector: Solid Waste

It should be noted that the current capital expenditure for the MLM is zero and therefore the possibility of eradicating the backlog in the unserviced households is unfeasible. In the 2015/16 financial year, the MLM had a capital expenditure of R 419 000, and no capital budget in the subsequent years (IMQS, 2019). The MLM currently only budgets for operational costs of the waste collection service.

According to the MLM Asset Management Plan (AMP), the total annual operational costs to achieve a 100% waste collection service in the urban and rural areas is R 1,7 million. The details of these are provided in the table below. The capital costs required to eradicate the backlog of the waste collection service is indicated in the table below as well. The infrastructure details of what the capital costs should

be budgeted for were not indicated in the AMP report, however, the report does strongly recommended the development of waste transfer stations as the option for capital expenditure (IMQS, 2019).

Table 42: Capital and operational cost implications to the MLM to address the waste collection service backlog and achieve 100% collection *(IMQS, 2019)*.

Cost of Upgrading to Target Level				
	Resolving no service backlog capital (once off cost)	Resolving no service backlog operations (cost per annum)	Resolving urban lack of service backlog capital (once off cost)	Resolving urban lack of service backlog operations (cost per annum)
Urban			R 104,000	R 30,000
Tribal/Traditional	R 11,108,000	R 1,566,000		
Farm	R 482,000	R 68,000		
Total	R 11,590,000	R 1,634,000	R 104,000	R 30,000
Total Capital Backlog Eradication:				**R 11,694,000**
Total Operational Backlog Eradication per annum:				**R 1,664,000**
Total Costs to Eradicate Waste Collection Backlog				**R 13,358,000**

The 10-year life cycle plan according to the AMP of the MLM indicates that approximately R 1.2 million should be budgeted a year for capital costs (for investment and renewal costs) to address the existing waste collection backlog and the future increased waste generation to occur in the MLM. The R1.2 million budgeted per year for 10 years equates to the R 12 million capital cost that is required according to Table 42.

The AMP also indicates that should these assets be developed in the MLM such as the transfer stations that the maintenance budget for these assets will increase per year from approximately R 292,000 in 2019 to approximately R 850,000 by 2028. The increase in maintenance budget per year correlates with the R1.2 million in capital costs budgeted for per year. The maintenance costs are taken as a percentage of the current replacement cost (CRC) of the assets.

The operational costs for the MLM to provide a waste collection service to all households with the use of the skip system was estimated to be R1,7 million according to Table 42 above. This is the conservative cost to provide a waste collection service to all households.

The AMP indicates that to eradicate the waste collection backlog in the MLM, and should the infrastructure be developed as recommended with the increased capital costs, that approximately R 5,000,000 should be budgeted per year from 2019. The increased operational cost is due to the higher service level to be provided to all households in the MLM. This operational cost is significantly higher than the conservative cost due to the large distances required to travel to the uThungulu landfill site. The AMP indicates that the development of transfer stations and local landfill sites would significantly reduce the operational costs.

It was noted that due to the large financial costs to completely eradicate the waste collection backlog, the MLM should focus on specific areas for the provision of waste collection services and that these areas should be prioritised for waste collection services. This is mainly due to the budget constraints of the MLM, that funding for the waste department is very limited and that the provision of the communal collection service with skips has no associated increase in collection fees (IMQS, 2019).

(b) The Mandeni Local Municipality, Solid Waste Current Assets and Replacement Value

According to the Asset Management Plan for the MLM, the waste department only owns skips, bins and vehicles for waste collection (IMQS, 2019). The report notes that bins are in poor condition and will need to be replaced in the short term, especially the wheelie bins, and that the municipality would need to budget for these. In contrast, the skips and vehicles have a 'very good' and 'good' portfolio health grade respectively.

The total asset purchase value for solid waste in the MLM is represented as R 4.7 million in the financial asset register. The calculated replacement value in 2018 is at R 5.2 million (which accounts for the time value of money). The depreciated replacement cost is at R 3.6 million, which based on the CRC, indicates that the majority of the portfolio has not yet depreciated.

The skips are placed across large distances in the MLM to maximise their service potential to peri-urban and rural households. However, this significantly influences the maintenance and life of the waste collection vehicles as there are no transfer stations being used by the MLM and no landfill sites within the MLM in use by the MLM, hence vehicles have to travel large distances.

3.9.3 Waste Tariffs

Tariffs for municipal waste collection is key source of income for the MLM. The introduction of cost-recovery tariffs enables municipalities to fund the "maintenance, renewal and expansion of solid waste

infrastructure" (DEA, 2011). The local municipality is tasked with setting waste tariffs. The tariff should be considered carefully in order to set a fee that is in line with the goals of the tariff. The goal of the tariff is to recover collection costs as far as possible and remain a financially viable service for the majority of domestic and commercial units. Tariffs must reflect the costs associated with providing the service, including operating and maintenance, capital, replacement and financing costs, taking into account other subsidies the municipality may have (DEA, 2011). Waste tariff setting should be done with the aims of promoting waste minimisation and the economical, efficient and effective use of resources taken into consideration.

The MLM 2017 IDP indicates that the waste tariffs generally increase by 6% each year. It also indicates that higher increases in the waste tariff would not be viable due to the higher waste tariff increases in previous years as well as the overall impact of higher than inflation increases to other community services. It further indicates that a rate increase higher than 6% would be counter-productive and will result in affordability challengers for individual rate payers and increase the risk of bad debt (Mandeni Local Municipality, 2017). However, it is noted that a full cost accounting exercise to determine the true cost of the required waste management service within the MLM has not been undertaken for the MLM to date. This is important as it would assist the MLM in understanding the true baseline tariff that should be charged, considering that the MLM is currently not providing the level of waste infrastructure and service that is required. The waste tariffs from 2012/2013 to 2016/2017 are provided in the table below.

Table 43: Waste removal tariffs within the MLM (Annexures to the IDP and annual budgets) (the tariffs for 2017/18 – 2019/20 were not provided by time of submission of the report)

	2013/2014	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020
Business Removal							
Per bag	R 17.43	R 18.47	R 19.58	R 20.87	R 22.21	R 23.54	R 24.76
Per bin/receptacle	R 31.35	R 33.86	R 35.89	R 38.26	R 40.71	R 43.16	R 45.40
per drum	R 72.61	R 76.96	R 81.58	R 86.96	R 92.53	R 98.08	R 103.18
Hospitals, Schools and benevolent societies and institutions							
Per bag	R 14.52	R 15.39	R 16.32	R 17.39	R 18.51	R 19.62	R 20.64
Per bin/receptacle	R 29.04	R30.76	R 32.63	R34.79	R 37.01	R 39.23	R 41.27
Garden waste and bulky refuse from other than trade and manufacturing premises							
Per load of 4 m^3	R 487.91	R 517.18	R 548.21	R 584.39	621.79	R 659.10	R 693.38
Per load of 1 m^3	R 121.98	R 129.30	R 137.05	R 146.10	155.45	R 164.78	R 173.34
Builders rubble per load	R 754.68	R 799.85	R 847.84	R 903.60	R 961.64	R 1019.34	R 1072.35
Scrap vehicles	R 1530.96	R 1622.81	R 1720.18	R 1833.72	R 1951.07	R 2068.14	R 2175.68
Carcasses	R 502.54	R 532.70	R 564.66	R 601.92	R 640.45	R 678.87	R 714.18
Domestic refuse waste collection							

Per house including churches per month per 5 bags	R102.52	R 109.57	R 115.19	R 122.79	R 130.65	R 138.49	R 145.69
Per flat per month per 5 bags	R102.52	R 109.57	R 115.19	R 122.79	R 130.65	R 138.49	R 145.69

The municipality has the challenge of billing correctly for the actual waste removal service being delivered to a particular customer. It was noted that the truck drivers and refuse removal team are sometimes asked to remove waste more often than what is being paid for by the business and households in question. Some businesses and households also put out extra bins and black bags to increase the amount of waste that is removed from their premises without paying the appropriate fee for the additional receptacles. The waste removal team do not have easy, quick access to a database of rate payers to enable them to verify the correct quantity and frequency of removal service required by each business.

3.10 Planned Waste Projects

The Mandeni IDP 2017-2022, (Mandeni Local Municipality, 2017), has proposed the two projects presented in the table below. Details regarding the implementation of these projects were not confirmed by the waste management department.

Table 44: Planned Waste Projects in the Mandeni Local Municipality (Mandeni Local Municipality, 2017)

Waste Management	Funding Source	2018/19	2019/20
Waste Management			
Acquisition and rehabilitation of the Isithebe Waste Transfer Station		R 3,000,000	R 3,180,000
Planning Projects			
Environmental Awareness Programme (in all wards)	MLM (Equitable Share)	R 130,000	

3.11 Waste Information Management

The MLM has yet to define a system for managing waste information and waste information management is generally poor. Waste disposal tonnages are recorded at the King Cetshwayo regional landfill site, but this information is not collated by the waste department. No historical dataset of disposal

tonnages was available when requested; only 6 months of disposal tonnages (January to June 2019) was made available by the MLM.

The most obvious challenge is that there is no individual in the waste department that is collecting the waste tonnage data from the King Cetshwayo landfill site on a regular basis. This data could also be collected from the finance department which receives invoices for the disposal of waste.

3.12 Community Waste Awareness Campaigns

The MLM does not have a formal programme for waste management campaigns and waste education initiatives. It is noted that the Youth Jobs in Waste programme, funded by DEA, ran awareness campaigns in 2016 and 2017 that focused on raising environmental awareness and cleaning within the MLM. There are no records of the number of awareness campaigns undertaken, but several waste awareness campaigns were conducted at schools and within the community with door-to-door visits.

Unfortunately, none of the employees involved in these projects were subsequently permanently employed by the waste management directorate which means that all the skills and experience developed through the programme were largely not retained by the municipality.

The MLM does not have Waste Community Liaison Officers (CLOs). The iLembe District Municipality and the Department of Agriculture, Environmental Affairs and Rural Development have designated representatives who could assist with waste awareness initiatives.

4 GAP AND NEEDS ANALYSIS

4.1 Requirements in terms of policy and legislation

The table below holds key requirements imposed on the MLM by current policy, legislation and guidelines. All key requirements are listed, irrespective of whether the MLM complies or not. Activities that are recommended by policy/ legislation, but not necessarily required, have not been included. Draft regulations have been considered as an indication of likely imminent requirements. The needs are presented under the following broad topics defined in the National Waste Management Strategy:

- Institutional issues including:
  - Financial management
  - Human resource management
  - Waste information management
- Waste management service delivery including:
  - Recycling and minimisation of waste
  - Waste Collection and Storage
  - Waste Treatment and Disposal
- Public awareness including:
  - Public awareness and communication

Table 45: Key legal/policy requirements applicable to the MLM's waste management function.

Topic	Requirement
Institutional Issues	
Municipal waste planning and human resources	**National Environmental Management: Waste Act (59 of 2008):** • Municipalities must submit an IWMP to the MEC for approval. • Municipalities must integrate the IWMP into the IDP. • Municipalities must follow the consultative process as defined in Section 29 of the MSA (separately or as part of the IDP). • Municipalities must formally designate a waste management officer. • Municipalities must submit annual reports of the implementation of the IWMP in terms of Section 46 of the MSA. **National Policy for the Provision of Basic Refuse Removal (BRR) Services to Indigent Households (GN413 of 2011)** • Municipalities to integrate the national BRR policy into the MLM's Indigent Policy, if present.

	• Municipalities to consider formally identifying deserving households/areas for BRR services • Municipalities to implement and maintain indigent register system in line with policy, and implement management programmes to minimise fraudulent activities. • Regularly update the indigent register.
Financial management	**National Environmental Management: Waste Act (59 of 2008):** • All municipalities must keep separate financial statements including a balance sheet of services provided. **Municipal Systems Act (32 of 2000):** • Municipalities must set tariffs and strive to provide waste services in financially and environmentally sustainable manner.
Waste Information management	**National Waste Information Regulations (GNR 625, 13 August 2012)** All those conducting activities listed in Annex 1 must register on SAWIC. • Activities at different facilities must be registered individually. Includes landfills. Excludes the storage of waste. • Quarterly information to be submitted to the SAWIC by a registered person • All information submitted must be kept for minimum of 5 years.
Service Delivery	
Waste reduction	**National Environmental Management: Waste Act (59 of 2008):** • All municipalities must put in place measures that seek to reduce the amount of waste generated, and where generated, measures to ensure that it is re-used, recycled and recovered, treated and disposed of.
Waste recycling and drop-off centres	**National Domestic Waste Collection Standards (GN21 of 2011)** • The service provider/municipality must provide guidelines to households on how to separate waste. • The municipality must encourage community involvement in recycling. • The municipality must provide an enabling environment for household recycling to include either a) undertaking kerbside collection of recyclables, or b) ensuring Communal Collection Points for recyclables (including “non-mainstream recyclables” such as batteries, fluorescent tubes etc.) for collection by private service providers. • Collection of full containers from drop-off centres must be done within 24 hours of being reported full. **National Norms And Standards For Sorting, Shredding, Grinding, Crushing, Screening or Baling Of General Waste (GN1093 Of 2017)** • All waste facilities undertaking these activities must register in terms of GN1093 of 2017. All these facilities which have an operational area of 1,000m^2 or more must comply with all requirements set out in the standard.

	National Norms And Standards For Scrapping Or Recovery Of Motor Vehicles (GN925 of 2013) • Sets minimum requirements for the design, construction and upgrade of motor vehicle scrapping facilities as well as minimum requirements for operation of these facilities **National Organic Waste Composting Strategy, Draft (2013)** • WMOs and Municipal Managers need to report, under their IWMP's, projects proposed to be undertaken by them to beneficiate organic waste (in this instance) by means of composting operations.
Waste collection	**National Domestic Waste Collection Standards (GN21 of 2011)** • Non-recyclable waste (i.e. domestic): A weekly service is required as a minimum, in urban areas. • Weekly collections must be consistent – the same day of the week, the time which waste is put out for collection must be stipulated. • If a collection is missed or the service is interrupted the service must resume as soon as possible and the waste must be removed no later than on the next scheduled collection day. • Changes to collection service e.g. public holidays must be publicized in advance. • Recyclable waste to be collected once every two weeks. • Bulk containers and Communal Collection Points to be collected when full, or within 24hrs of reported as full, but not less than once per week. • All refuse collection workers must receive regular medical check-ups, appropriate PPE and on-going health and safety training. • Roadworthiness of all collection vehicles to be ensured. • Waste must be transported in closed vehicles. • Skips should be managed in line with the Collection Standards **National Policy for the Provision of Basic Refuse Removal Services to Indigent Households (GN413 of 2011)** • Municipalities must identify indigent households and maintain a register of indigent households (GN 34385) • Households to be provided with free receptacles for refuse storage. • Appropriate collection frequencies are a) weekly for biodegradable waste, b) monthly for recyclables (rural areas), c) fortnightly for recyclables (urban areas) • Skips must be considered a last resort, and should be cleared often enough to prevent dumping.
Storage of waste	**National Norms & Standards for the Storage of Waste (GN926 of 2013)** • These requirements must be taken into account when designing and managing storage facilities with capacity >100m^3 e.g. transfer stations. Things to consider include access control, signage, leak prevention etc. **Waste Tyre Regulations (2017)**

	• Waste tyres may not be disposed to landfill • A waste tyre storage area for a tyre dealer must not exceed 500 m^2 and any other waste tyre storage area must not exceed 30,00m^2 and must comply with section 10 of the regulation • Waste Tyre Storage Plans for a waste tyre storage sites are to be approved by the Municipalities' Fire Department. • Owners or managers of waste tyre stockpiles (a stockpile 500 m^2), must submit a waste tyre stockpiles abatement plan to the competent authority.
Waste Disposal	**National Standards for the Assessment of Waste for Landfill Disposal (GN635 of 2013)** • These standards put forward a standard assessment methodology for determining the waste type and appropriate landfill type for disposal. **National Standards for the Disposal of Waste to Landfill (GN636 of 2013)** • These standards place restrictions on disposal of certain waste to landfill. New landfill site liner requirements will apply to any new cells constructed at any landfill site. • Require that 25% of baseline of separated garden waste be diverted from landfill by 2018 • Require that 50% of baseline of separated garden waste be diverted from landfill by 2023 • Prohibits disposal of infectious and animal carcasses to landfill.
Public Awareness	
Public awareness and communication	**National Domestic Waste Collection Standards (GN21 of 2011)** • All complaints regarding waste must be dealt with promptly, and responded to within 24 hours. • An effective register of complaints must be kept. • Municipalities must create awareness around key waste issues as defined in the standards including illegal dumping, recycling and composting • Municipalities must provide clear guidelines on different domestic waste types, source separation, appropriate containers for domestic waste and disposal methods for waste not collected by kerbside refuse collection service
Capacity building and training	**National Policy for the Provision of Basic Refuse Removal Services to Indigent Households (GN413 of 2011)** • Municipalities must implement education and awareness training regarding the BRR services in relevant areas.

4.2 Gaps and Needs Analysis

This section presents the waste management gaps and needs in the MLM area as identified through the IWMP process and the situational analysis investigation undertaken as part of the development of the IWMP. It is limited to municipal services needs in line with the scope of the IWMP. It is informed by interviews with municipal staff as well as site visits and research. The gaps identified are presented in the table below.

Table 46: Gap and Needs Assessment for Waste Management in the Mandeni Local Municipality

Topic	Gaps	Needs
Institutional Issues		
Financial management	• The MLM has not undertaken a formal review of their waste tariffs including a full cost accounting review of their waste service costs. • The finance department and the waste department do not have systems in place that allow them to verify that people (particularly business) are being charged correctly for services rendered. • No feasibility assessment has been undertaken to determine cost savings to the municipality through development of infrastructure to divert waste from landfill to MRFs, composting facilities or construction and demolition waste (C&DW) crushing facilities, etc.	• A full cost accounting review of their waste service costs and a formal review of their waste tariffs should be undertaken by the MLM. This review should also consider the operational costs of implementing recycling and the development and operational costs of required waste infrastructure including transfer stations, drop-off centres and a MRF. • A formal system should be developed to verify that people (and particularly) businesses are correctly billed for the waste collection service they receive for the MLM to recover costs on the services rendered. • The MLM should undertake a cost comparison of the existing waste collection services to the development and provision of transfer stations, MRFs, waste drop-off centres and removal of recyclable waste from the waste disposed of at the landfill and the reselling costs of the recyclables to the economy.
Human resources: Staff and training	• Most waste managers and supervisors have little to no job-specific training • There is no documented training plan for waste managers and supervisors. Identification of targeted training courses available to address knowledge gaps has not been undertaken. • There is a lack of waste planning capacity at the MLM including a lack of awareness of waste legislation and best practice options for waste management. • There is a staff shortage and unfilled posts within the waste department • The waste management officer position is currently vacant. This is a key legal non-conformance.	• The waste management officer position and nine vacant waste collector posts should be filled. • The waste management organogram should be reviewed to ensure sufficient staff are employed to expand the waste collection. The appointment of staff for awareness campaigns, illegal dumpsite cleanup campaigns, and illegal dumping enforcement should be included in the amended organogram. Critically, the responsibility for the management of waste information and data should be designated to a staff member with numerical literacy and Excel skills. • A documented training plan for waste managers and supervisors should be developed with targeted training courses available to address knowledge gaps with regards to waste management, management of waste information and development of waste recycling programmes.

Topic	Gaps	Needs
	• A number of the waste collection staff are constantly ill or incapacitated. • Administrative challenges with collating waste collection data with the billing system.	
Waste Information management	• Lack of awareness of the need for waste information recording and reporting among staff. • The MLM has only recently (since January 2019) commenced with the collation of waste collection and disposal tonnages for domestic waste within the MLM and the municipal office paper recycling programme. • The MLM does not collate any general waste, industrial or recycled waste information for businesses or private companies within the MLM. • The MLM is not informed about waste management practices in the Isithebe Industrial Estate	• The MLM should continue to collate the waste collection and disposal tonnages of domestic collection waste for the MLM. The collation of information for the masses of the MLM office recycling programme should continue as well. • The MLM should report the waste disposal tonnages to landfill on the SAWIS. • The MLM should educate and instruct all business and companies that generate large quantities of waste to register their companies on the SAWIS and to indicate on their waste disposal and recycling tonnages on SAWIS. The MLM should follow up on the submission of waste tonnage information on the SAWIS. • The MLM needs to engage with the Isithebe Industrial Estate to understand their current waste practices, waste tonnages, and recycling tonnages.
Future Planning	• There is no documented infrastructure plan which considers site selection and costs for waste facilities. These facilities include transfer stations, MRFs, drop off centres and buy-back centres. • The is no working mechanism for the waste department to provide input (e.g. road width and inclusion of waste drop-off centers) into the design requirements of new settlement areas. • No plan or feasibility study exists which considers the expansion of waste collection services to the peri-urban and rural areas that are currently unserviced.	• A waste infrastructure masterplan which identifies sites/ erven for the development of required waste infrastructure such as transfer stations, MRFs, drop off centres and buy-back centres should be developed. This needs to consider the possible future development of a district landfill site. • The MLM should develop a plan for the expansion of the waste collection services to those serviced peri-urban areas in the MLM. This would largely be through the expansion of the communal waste skip system to rural areas within the MLM.
Waste Monitoring		

Topic	Gaps	Needs
Monitoring	The MLM has no system in place for the monitoring the LMs implementation of their IWMPs.	• The MLM should ensure that an annual performance review of the IWMP implementation plan is undertaken.
Service Delivery		
Waste Minimisation and Recycling:	• Lack of infrastructure to enable recycling e.g. buy-back and drop-off centres, or Material Recycling facility (MRF) • Lack of municipal-lead recycling initiatives such as separation at source programmes. • Lack of municipal employees with experience of managing recycling facilities. • Lack of waste minimisation and re-use initiatives and education • Lack of support of communities for re-use of waste initiatives	• The MLM needs to consider the development of a MRF and recycling facilities at future waste drop-off centres, so as to make recycling facilities more readily available to the public. This should be investigated and planned as part of the waste infrastructure masterplan referred to above. • The MLM needs to consider instituting a formal waste recycling programme, including separation at source recycling initiatives, initially in the form of a pilot project. • The MLM needs to engage with the private recyclers in the area, maintain a list of such recycling companies and an estimation of their volumes
Waste Collection and storage	• Lack of maintenance schedules for vehicles resulting in frequent vehicle breakdowns • Lack of backup of refuse collection vehicles and no vehicle replacement plan is in place • Lack of waste containers/ storage areas for businesses in Mandeni • Lack of provision of black bags to indigent communities • Lack of documentation detailing waste collection • Lack of planning in terms of skip placement. At times, skip bins were placed based on preference to people within the community. The skip bins should be placed based on population densities in the rural areas and in areas where the skip is accessible to the compactor for servicing. A mapping exercise should be	• The MLM needs to develop and implement vehicle maintenance and replacement plans for its waste fleet. • The MLM needs to purchase (or secure lease contract) another REL compactor to provide backup capacity in the case of breakdowns. • Provision of further waste containers and bins in the business areas in Mandeni • The MLM need to consider provision of waste collection bags to those using the communal skip system. • The MLM needs to develop a documented waste collection plan that will focus on the mapping of collection areas, collection routes to be used by vehicles, mapping of waste collection skips, and where to place these skips to effectively expand the future collection service

Topic	Gaps	Needs
	undertaken. •	
Waste Treatment and Disposal	• MLM currently transports waste 160 km (return trip) to the uThungulu landfill site. No proper investigation has been undertaken to determine exactly what the barriers to using the local SAPPI landfill are, and what the costs to address these barriers would be. These costs should be considered in light of the high haulage costs that the MLM is currently incurring. • There are no municipal facilities in the MLM available to the public for disposal of surplus waste, or for use by those who do not receive a waste collection service. The Sappi Landfill site is not open to the public, and hence the people within the MLM have no local disposal options.	• A cost comparison for waste disposal at the uThungulu landfill site, the SAPPI Tugela landfill and the Dolphin Coast Landfill should be undertaken to determine which waste disposal service would be most viable and feasible for the MLM. • The MLM needs to compile a waste infrastructure masterplan referred to above, and to develop required infrastructure. • The MLM needs to develop and implement the Infrastructure Masterplan discussed above, particularly the development of drop-off centres and transfer stations. This will provide the public with accessible waste facilities.
Public Awareness		
Public awareness and communication	• No staff have been designated as specifically responsible for the role of waste education within the community service directorate • No formal waste campaigns and education programmes are being run. The last programme were conducted as part of the Youth Jobs in Waste programme. • Lack of education of informal collectors. • Lack of training resources (posters, fliers etc.) for waste awareness.	• The role of waste awareness officer needs to be allocated to a specific staff member or, ideally, a post created for this role. • The MLM needs to develop a waste awareness and education programme within the MLM that covers the full ambit of responsible waste management including waste minimisation, and decreasing illegal dumping. • The MLM needs to prioritise areas where illegal dumping is common and severe for awareness campaigns. Monitor these areas for a period after the awareness campaigns to determine whether the awareness campaigns were a success. • The MLM needs to keep comprehensive records of all awareness activities that it undertakes or supports.
By-Law Compliance and Enforcement		

Topic	Gaps	Needs
By-law enforcement	• There is no by-law enforcement currently being undertaken for waste management in the MLM. • There is no training of peace officers that can serve to enforce the waste by-laws in the MLM.	• The MLM should ensure that peace officers are trained to enforce waste management by-laws.
Littering and illegal dumping	• Insufficient street-side bins and communal skips within wards that currently do not have waste skips and that do not receive a waste collection service • Vehicles (TLB and tip truck) to collect waste from illegal dumping hotspots • Insufficient staff to clear illegally dumped waste • Access to areas where illegal dumping has occurred with large waste collection vehicles is often not possible due to the lack of access roads, and terrain. Dumping increases in areas where dumping is not removed • The community is not educated about why dumping is a serious issue and it has become an accepted practice	• The MLM needs to provide street side bins in business/commercial areas within the MLM and communal skips within wards and areas that do not currently have a waste collection service and where illegal dumping is severe. • The MLM needs to secure (purchase or lease) the needed plant to facilitate clean-up of illegal dumping hotspots. • The MLM needs to secure the needed staff to address illegal dumping.

5 Objectives, Targets and the Desired End State

This section presents the broad key focus areas for waste management from a national level to a local municipal level and defines where waste management improvements should be directed for the MLM. It presents the key waste management objectives for the MLM and gives targets and indicators for measuring their implementation.

5.1 National Waste Management Strategy Objectives

The 2011 National Waste Management Strategy (NWMS) presents a national strategy for improving waste management in South Africa and hence is key in guiding what all spheres of government should be aiming to achieve in terms of waste management. The NWMS is structured around a framework of eight goals. The goals along with their respective targets were supposed to have been met by 2016. The NWMS is currently under review, but has not yet been finalised, hence the goals below are those presented in the 2011 strategy.

Table 47: National Waste Management Strategy Objectives

Goal	Targets for 2016
Promote waste minimisation, re-use, recycling and recovery of waste.	• 25% of recyclables diverted from landfill sites for re-use, recycling or recovery. • All metropolitan municipalities, secondary municipalities, and large towns have initiated separation at source programmes. • Achievement of waste reduction and recycling targets as set in industry waste management plans for paper and packaging, pesticides, lighting (CFLs) and tyre industries
Ensure the effective and efficient delivery of waste services.	• 95% of urban households and 75% of rural households have access to adequate levels of waste collection services. • 80% of waste disposal sites have permits.
Grow the contribution of the waste sector to the green economy	• 69,000 new jobs created in the waste sector. • 2,600 additional SMEs and cooperatives participating in waste service delivery and recycling
Ensure people are aware of the impact of waste on their health, well-being and the environment.	• 80% of municipalities running local awareness campaigns • 80% of schools implementing waste awareness campaigns
Achieve integrated waste management planning.	• All municipalities have integrated their IWMPs with their IDPs, and have met the targets set in IWMPs • All waste management facilities required to report to SAWIC have

	waste quantification systems that report information to WIS
Ensure sound budgeting and financial management for waste services	• All municipalities that provide waste services have conducted full-cost accounting for waste services and have implemented cost reflective tariffs
Provide measures to remediate contaminated land.	• Assessment complete for 80% of sites reported to the contaminated land register • Remediation plans approved for 50% of confirmed contaminated sites.
Establish effective compliance with and enforcement of the Waste Act	• 50% increase in the number of successful enforcement actions against non-compliant activities. • 800 environmental management inspectors (EMIs) appointed in the three spheres of government to enforce the Waste Act

These goals were ambitious and were largely not achieved in South Africa, particularly those pertaining to municipalities. The goals do however provide an indication of the direction in which waste management practice should be moving in the country.

5.2 Provincial IWMP Objectives for Waste Management

The following objectives where highlighted in the 2012 KwaZulu-Natal IWMP:

To address the high backlog in domestic waste collection services experienced in several municipalities. A total of 60% of municipalities in the province are not providing a waste disposal services to more than 75% their population.

- Licence the general waste landfill sites within the province as many landfill sites were operating without a license and were poorly managed.
    - All landfill sites were to be registered on the South African Waste Information System (SAWIS system) and waste information was to be recorded and updated regularly.
- Develop, publish and implement norms and standards which all major waste recyclers and waste recycling service providers need to comply with. These waste recyclers and service providers were to register with the EDTEA and submit information on waste collected or treated for recycling.
- Define the basis for the introduction, maintaining and promotion of sound recycling initiatives within KZN.
- Ensure that district and local municipality IWMPs report on the measured or estimated quantities of recyclable waste collected and disposed; and set clear, measurable and sufficiently challenging targets for recycling.

- Allocate or recruit sufficient resources and to develop the specialist skills in EDTEA to manage complex procedures, decisions and monitor all the steps in the remediation process of contaminated sites identified in the province. This included developing a register and map with all known contaminated land sites
- Move integrated waste management within the province forward towards a more sustainable state of affairs.
- Identify and document current problems, issues and gaps in waste management.
- Provide a basis for the development, promulgation and/or review of provincial integrated solid waste management regulations that would regulate waste management within the province, as well as serve as a disincentive for poor waste management practices (if necessary).
- Guide, support and challenge district and local municipalities to implement integrated waste management effectively.
- Guide, challenge and implement incentives for private organisations within the province to implement best practice waste management.
- Promote, encourage and support public involvement and forums in all KZN provincial government related waste strategies and activities.

5.3 iLembe District Municipality IDP Waste Management Objectives

The only waste management objective set in the iDM IDP is the development and adoption of the iDM IWMP by 2019/20. The following actions to improve waste management are proposed in the iDM IDP:

- The development of the district's IWMP
- Pilot a recycling programme
- Increase people's awareness of the advantages of good waste management practices.
- Develop a public landfill for the district, since the operation of a regional landfill site is the mandate of the District.

The IDP notes that the current waste management initiatives include the EPWP "food for waste" and "recycling", however no details about the budget or programme are given.

5.4 Strategic Objectives in MLM IDP 2017-2022

A summary of the Strategic Objectives for Cleansing Services given in the Mandeni IDP is listed below:

- The importance of implementing the priority projects in the 2015 IWMP and monitoring the performance thereof.
- Address illegal dumping which is a major concern in towns within the MLM by waste education programmes targeted at schools and residents.
- Expand the waste collection service within rural areas of the MLM by purchasing more waste skip bins as this was noted as a success to expanding the waste collection service
- Promoting recycling initiatives
- Acquisition of additional equipment, plant and vehicles to improve the waste collection and disposal service

5.5 MLM IWMP Objectives and Targets

A total of nine objectives, presented below, have been defined through the IWMP process informed by:

- The Situation Analysis.
- The Gap and Needs Assessment.
- Input from the Situational Analysis and Gap and Needs Assessment PSC workshop.
- Input from draft IWMP PSC workshop.

In line with section 12 of the Municipal Planning and Performance Management Regulations, 2001, the IWMP should set targets that are:

- Practical and realistic;
- Measure the efficiency, effectiveness, quality and impact of the performance of the municipality, administrative component, structure, body or person for whom a target has been set;
- Commensurate with available resources;
- Commensurate with the municipality's capacity; and
- Consistent with the municipality's development priorities and objectives set out in its integrated development.

The objectives in this section represent key areas which, if addressed, will contribute significantly to the MLM fulfilling its broader waste management mandate over the next five years and they typically address the most pressing waste management issues in the MLM. The current financial limitations of the MLM have however been considered, and the objectives developed with this in mind. Nonetheless,

the recent waste policy and legislation changes necessitate the inclusion of certain objectives so as to ensure legal compliance. The objectives will not necessarily address all waste management challenges facing the MLM and not all projects or interventions planned under Section 5 will necessary have a "home" under the objectives below. Finally, the objectives have, as far as possible, been structured so as to make them measurable.

5.5.1 Objective 1: Financial Management and Tariff Structure

A review of the cost of waste services provided in the MLM has been undertaken through an Asset Management Plan (AMP) for solid waste that was developed for the MLM in May 2019. The AMP provides details of the costs required by the MLM to eradicate the backlog of waste services in the MLM over a ten year period to ensure that each household receives a weekly waste collection service. The AMP also details the shortfall of the current tariff billing system and the negative effects this has on the MLM performing the waste collection service. The shortfalls are the MLM not billing all businesses and households correctly for the waste collection service provided and the MLM not receiving the monies from households and businesses once they are billed for the waste collection service.

A reconciliation of the billing system and collection services should be done. The frequency of collection services given to households and individual businesses needs to be compared to the current billing system to ensure that all households and businesses are being billed appropriately. It is possible that some businesses are being undercharged.

Greater communication between the finance department, responsible for tariffs and billing, and the waste department will facilitate the above processes. The required budget for the IWMP implementation must be determined and compared with the approved waste management budget and projected budgets annually so that funding can be sought for projects that will not be covered by the department's annual budget.

(a) Objective

Ensure that waste management budget is sufficient for implementing the IWMP and AMP, and that appropriate tariffs are charged that reflect the true cost of waste services provided.

(b) Targets

- The waste management budget is to be reviewed, and all costs associated with the implementation of this IWMP and the AMP are to be specified so as to determine the funding shortfall and ensure funding and budget over the next five to ten years.
- Undertake a full cost accounting exercise for the waste service, determining the true complete cost of providing the current waste service, as well as that required ito this IWMP
- Undertake a tariff setting exercise following 11 steps given in the solid waste tariff setting guidelines for local authorities (2011) by the end of the 2020/21 financial year.
- Undertake reconciliation of tariffs charged and collections services delivered to businesses to ensure that these businesses are charged correctly. To be repeated every 5 years minimum by the end of 2020/21 financial year.
- Develop a system of registering houses on tribal land, where relevant, on the customer database, by 2020/21 financial.

5.5.2 Objective 2: Internal Management Planning and Resourcing

In accordance with Section 10(3) of the Waste Act, MLM must designate in writing a 'Waste Management Officer' from its administration. The Waste Management Officer is responsible for coordinating matters pertaining to waste management in that municipality. The Waste Management Officer must coordinate waste management activities in the manner set out in the national waste management strategy.

Vacant posts as identified within the waste services organogram should be filled and a training programme needs to be developed for induction training and on-going training for new and existing employees.

(a) Objective

Ensure the waste department is sufficiently staffed and capacitated to fulfil its waste management mandate.

(b) **Targets:**

- Appoint and formally designate a sufficiently capacitated WMO, in writing, by the end of 2019/2020 financial year.
- Fill vacant posts within the current waste management department according the organogram.
- Revise the waste management sub-directorate organogram based on the requirements of this IWMP. Thereafter, create and fill these posts according to the revised organogram.
- Document the roles and responsibilities in the form of job descriptions of each employee of the waste department according to the organogram.
- Develop a training needs list with proposed dates and training courses for training of all staff included in the revised organogram by end of the 2019/20 financial year. This training needs list will feed into the MLM's training plan.
- Submit annual reports of the implementation of the IWMP in terms of Section 46 of the MSA and Section 13 of the Waste Act.

5.5.3 Objective 3: Waste Information Management

Appropriate waste information management is lacking, and needs to be improved through developing a system for sourcing, collating, reporting and storing the required waste information. The collating of tonnage information for waste collected and disposed of at the uThungula regional landfill site was only started in January 2019 and this should continue for the MLM for the disposal of general waste. Historical tonnage data exist in billing records but have not been collated. In addition, recycled waste information should be collated by the MLM.

The National Waste Information Regulations require municipalities to be registered on the South Africa Waste Information System (SAWIS) and to report on the SAWIS on a quarterly basis (Department of Environmental Affairs, 2008). This is not currently being done. All requirements of the Waste Information Regulations need to be implemented. Training should be given to the staff responsible for overseeing waste information management in MLM.

Limited information on the waste stream composition is available for the municipality. One waste characterisation for waste collected within the MLM was undertaken as part of this IWMP exercise. Undertaking bi-annual waste characterisations will enable the municipality to determine the types of waste generated and better quantify the needs for recycling and disposal facilities across the various towns and settlements.

(a) Objective

Management of waste information in a manner that makes it accessible and useful, and that complies with the Waste Information Regulations.

(b) Targets

- Establish an appropriate waste information system that includes a data capture and reporting procedure for waste tonnages recorded at the landfill sites and waste facilities by the end of 2019/20 financial year.
- Comply with Waste Information Regulations registration and reporting requirements.
- Registration on the SAWIS by the end of 2019/20 financial year.
- Reporting waste tonnages on a quarterly basis on the SAWIS from the end of 2019/20 financial year.
- Undertake bi-annual characterisation exercise of waste stream in the MLM.

5.5.4 Objective 4: Waste Minimisation, Recycling and Re-Use

The National Domestic Waste Collection Standards (GN 21 of 2011) mandate the MLM to provide an enabling environment for household recycling and the NWMS set the goal of diverting 25% of recyclables from landfill sites by 2016.

The MLM is currently only facilitating a paper recycling initiative where office paper is recycled in the municipal offices and implemented a system in January 2019 to collate the mass of paper waste recycled. The MLM should expand on this recycling initiative within the MLM by recycling other types of waste, and to introduce the recycling initiative to more offices and public areas within the MLM. It was noted during municipal staff interviews that there is insufficient human capacity within the department to pursue this.

The MLM should create an enabling environment for recycling through a holistic approach of different initiatives including raising awareness and provision of recycling facilities and drop off centres. The provision of recycling drop off stations located in towns which are easily accessible by the public will significantly improve the facilitation of household recycling as well as raise public awareness of the option of recycling waste as an alternative to disposing it. The success of the drop off centres will be measured through the volumes (or mass) of recyclables processed at the facility. A Waste Infrastructure Master Plan should be undertaken to determine suitable locations to develop drop-off

centres. Awareness of these facilities should be promoted through awareness campaigns at public meetings, education initiatives at schools and with the use of social media.

Waste minimisation in the iSithebe Industrial Estate is not being coordinated and hence opportunities for improving recycling in the estate require investigation. The MLM should engage with the iSithebe industrial estate and investigate opportunities for improvement and provide assistance in improving on recycling and compliance of recycling within the Industrial Estate.

Another strategy for minimising waste disposed at the landfill is to encourage composting of garden waste. Garden waste and organic waste comprises approximately 36% of the total domestic waste stream and a facility for composting of this waste should be provided. This would assist the municipality to comply with the requirements of norms and standards for disposal of waste to landfill (Department of Environmental Affairs, November 2011).

(a) Objective

Create an enabling environment for waste minimisation and recycling within the MLM, and collate information on recycling to develop a hub (centre) of information regarding recycling. The recycling initiatives should be monitored by the MLM to ensure the success thereof.

(b) Targets

- Due to the lack of existing tonnages for recycled material for the MLM and recycling businesses, no specific numerical performance targets could be set. The following targets are proposed to ensure that these activities are commenced and to promote recycling within the MLM.
- Encourage separation of waste at source by incorporating recycling facilities into future waste drop off centres in town centres.
- Encourage participation of SMME's and co-operatives in waste re-use and recycling by assisting local businesses and community groups with re-use and recycling projects. Assist at least one business and one community group annually from the beginning of the 2020/21 financial year with their recycling initiatives.
- Commence with formalising and documenting waste reclaiming and recycling activities by the end of 2019/20 financial year.

5.5.5 Objective 5: Waste Collection and Storage

The National Waste Management Strategy requires municipalities to provide 95% of urban households and 75% of rural households with adequate levels of waste collection services. At present, in the MLM area, only 35% of households receive a collection service, 63% use their own or a communal refuse dump and 2% have no refuse removal service. Factors limiting waste collection in the MLM are the high proportion of rural households, the large transportation distances and the lack of road infrastructure to these remote rural households.

While it is not feasible for the MLM to provide waste collection services to meet the targets of the National Waste Management Strategy, the MLM must aim to extend the geographical range of waste collection services. They have, since the last IWMP review in 2015, demonstrated progress in this regard and have expanded the area serviced by their communal skip system. There are currently 108 bins deployed and a further 30 are proposed for this financial year to replace damaged bins and expand on the areas serviced. The MLM must continue to extend the geographical range of waste collection services to account for the expansion of urban areas.

A waste collection fleet management plan must be developed to ensure expansion of the collection service areas and timeous replacement for aging and failing vehicles. The lifespan, condition, and necessity of each vehicle should be evaluated and documented. This will enable the municipality to prioritize and budget for the expansion and replacement of vehicles over several years.

(a) Objective

To provide a reliable weekly collection service in urban areas and to continuously expand the waste collection service into the peri-urban and rural areas as feasible.

(b) Targets

- Undertake an annual collection route optimisation exercise to ensure that collections are being undertaken efficiently as possible from the beginning of the 2019/20 financial year.
- The MLM is to document a plan for the expansion of collection systems to the expanding urban areas and the peri-rural areas by the end of the 2020/21 financial year. This should indicate target expansion areas, anticipated timeframes and associated costs.
- A mapping exercise for the placement of skip bins in rural areas should be undertaken annually based on population densities and in areas where the skips are accessible to waste collection vehicles (waste compactor truck).
- A vehicle management plan and replacement roster is to be developed for all waste collection

vehicles by the end of the 2020/21 financial year to ensure the fleet remains operational and to ensure that more vehicles are procured for the system.

5.5.6 Objective 6: Waste Transfer and Disposal

There are no municipal owned landfill sites, transfer station facilities or drop-off centres in the Mandeni area, and hence no disposal facilities available for the public to drop off excess refuse, garden waste and builder's rubble at an affordable disposal rate. The Waste Management By-Laws require the public to drop-off builder's rubble at a disposal facility or transfer facility. The absence of easily accessible facilities has contributed to the severe local illegal dumping problem.

The MLM needs to develop, or secure public access to a transfer facility or drop-off facility, in close proximity to Mandeni, where the public can dispose of garden waste, excess domestic waste, and builder's rubble. Builder's rubble could potentially be used as cover material at landfill sites within the municipal area. Sappi and the iSithebe Industrial Estate both located within Mandeni should be engaged to determine if the facilities owned by these two organisations, namely a landfill site and transfer station, could be utilised for municipal purposes such as the disposal of general waste and the drop off of recycled waste collected by waste reclaimers.

(a) Objective

To provide the public with an accessible facility for the disposal of refuse, garden waste and builder's rubble.

(b) Targets

- Develop a Waste Infrastructure Masterplan by the end of the 2020/2021 financial year to plan for the development of transfer stations and waste drop off centres within the MLM.
- Develop, or secure public access to, a drop off centre or transfer station for the disposal of excess general waste, garden waste or builder's rubble by the end of the 2020/2021 financial year.
- The MLM to investigate the possibility and terms of agreement for the utilisation of the Sappi Tugela Landfill Site for the disposal of general waste and the iSithebe Industrial Estate transfer station for the disposal of recyclable waste by waste reclaimers. The MLM to conduct a cost comparison of utilising these facilities at a cost determined by these two organisations to establishing these facilities within the MLM. The MLM waste department should consider the time delay to establishing a landfill site, transfer station and drop off facilities in the MLM to utilising the existing facilities and

the positive environmental impact the immediate utilisation of these facilities would have for the MLM and the local economic development.

5.5.7 Objective 7: Waste Management Awareness

A lack of public waste management awareness was identified as a key issue in this IWMP process. The National Waste Management Strategy required that 80% of local municipalities and 80% of schools to be running waste management awareness campaigns by 2016. There is a real need for an ongoing awareness programme for waste issues, especially regarding waste minimisation and how to dispose of waste correctly to alleviate illegal dumping as well. Such a programme should engage schools, businesses and residential areas, and should include peri-urban areas. The MLM should also support and promote other awareness initiatives undertaken within the MLM that are coordinated by the DEA, EDTEA and the iLembe District Municipality (iDM).

(a) Objective

To ensure a programme of ongoing waste awareness campaigns in MLM area.

(b) Targets

- Establish an annual programme of awareness campaigns at the beginning of each year and align with the awareness campaigns of the DEA, EDTEA and the iDM. Schools and residential areas around the illegal dumping sites should be prioritised for awareness campaigns. Waste by-laws should be communicated through these awareness campaigns as well.
- The MLM should undertake at least 8 awareness campaigns/interventions per year.

5.5.8 Objective 8: Waste Management By-Laws and Compliance with Waste Legislation

Waste management by-laws were gazetted for MLM in 2010 and reviewed in 2015, but subsequent enforcement has been poor. The MLM should develop an enforcement plan to guide the enforcement of waste management by-laws. The plan should consider:

- How to apply penalties, and
- Required resources to implement the by-laws

The lack of resources for enforcement is a significant limiting factor and the appropriate human and financial resources must be allocated if enforcement is going to be successful. At least one Waste Ranger post should be created, whose mandate is the enforcement of the waste management by-laws. All existing MLM peace officers need to receive regular training on the waste management by-laws to assist in the enforcement of the these by-laws.

Finally, the MLM must undertake a campaign to ensure that all waste service providers are registered in terms of the by-laws.

(a) Objective

- Raise public awareness of the waste management by-laws.
- Successful enforcement of by-laws to reduce illegal dumping in the MLM area.

(b) Targets

- Develop an enforcement plan for by-laws and a system for maintaining electronic records of enforcement actions by the end of the 2020. Commence implementation of this plan 2020.
- Provide biennial training on the Waste Management By-laws to all persons involved in enforcing by-laws according to the enforcement plan developed.
- Appoint at least one waste ranger, whose core duty will be to enforce the by-laws by the end of the 2020/21 financial year. Such an individual should be an appointed Peace Officer so that they are empowered to issue fines.
- Train and formally appoint existing waste supervisors as peace officers so that they are able to enforce anti-dumping laws by the end of the 2020/21 financial year.
- Register all waste service providers as per the waste by-laws

5.5.9 Objective 9: Illegal Dumping

Illegal dumping is the result of various weaknesses in a waste management system, including the lack of infrastructure for waste disposal, the lack of waste collection service provision, public awareness, and enforcement of by-laws. Illegal dumping will be reduced through improved enforcement of by-laws, provision of communal skip facilities with a weekly collection service and public awareness campaigns.

(a) Objective

Reduce illegal dumping within the MLM.

(b) Target

- Undertake a dumping hotspot assessment and update this annually. The location of these sites should be mapped, and the size and degree (amount) of illegal dumping at these hotspots should be determined to determine the clean-up costs for these areas.
- Once the number of hotspots is determined through the mapping of all illegal dumping hotspots in the MLM, conduct dumping hotspot clean-up campaigns to reduce the number of illegal dumping hotspots by 50% by the end of the 2024/25 financial year.
- Provide prevention measures at these cleaned illegal dumping locations such as the placement of skip bins, provision of a waste collection service and erection of “no dumping” signage to reduce the occurrence of illegal dumping.
- Conduct awareness campaigns in areas where illegal dumping is common to decrease the occurrence of illegal dumping.

6 Implementation Plan

This section presents a plan by which the MLM aims to meet the objectives defined in the previous section of this report. The plan consists of a number of projects and initiatives which, if appropriately executed, should move the MLM towards realising these objectives. An implementation programme is presented in the table below. It is however acknowledged that the MLM faces numerous challenges in the implementation of these projects including financial and human resource limitations. It is therefore expected that the implementation programme will be modified during the next 5 year period as resource allocation changes.

Table 48: The Mandeni Local Municipality Implementation Plan

No.	Actions	Priority Rating	2019/20	2020/21	2021/22	2022/23	2023/24	Funding: cost	Funding: source
Objective 1: Financial Management and Tariff Structure									
1.1	Undertake a full cost accounting exercise to determine the true cost of the waste management function, by 2021/2022 financial year. Undertake a review of waste tariffs based on full cost accounting and future infrastructure demands	High		X	X			To be determined according to project scope. Approx. R100k	TBC
1.2	The waste management budget is to be reviewed, and all costs associated with the implementation of this IWMP and the AMP are to be specified so as to determine the funding shortfall and ensure funding and budget over the next five years.	High		X	X	X		To be determined according to project scope.	Internal budget
1.3	Undertake reconciliation of tariffs charged and collections services delivered to businesses to ensure that these businesses are charged correctly by the end of 2020/21 financial year. To be repeated every 2 years minimum.	High		X		X		Nil. Internal project	Internal budget
1.4	Develop a system of registering houses on tribal land, where relevant, on the customer database, by 2020.		X	X	X	X	X	Nil. Internal project	Internal budget
OBJECTIVE 2. Internal Management and Resourcing									
2.1	Waste Management Officer: Formally designate a Waste Management Officer by the end of the 2020/21 financial year. Section 10(3) of the Waste Act requires this. The prospective WMO must be competent, have the appropriate technical knowledge, receive appropriate training as required and sign acceptance of the responsibilities as specified in the Waste Act. The DEA guideline on appointing WMOs should guide the process.	High	X	X				Nil. Internal project	N/A
2.2	Organogram: Review organogram based on the needs of fulfilling the requirements of	High	X	X				Nil.	N/A

No.	Actions	Priority Rating	2019/20	2020/21	2021/22	2022/23	2023/24	Funding: cost	Funding: source
	this IWMP.							Internal project	
2.3	Fill new posts as determined to fulfil the requirements of the IWMP.	High		X	X	X	x	Determined by organogram requirements. Internal project	Internal budget
2.4	Formal job descriptions to be drafted for all positions within the Waste Management department. These should specify roles and responsibilities as well as technical knowledge and experience requirements. The roles and responsibilities document together with a contact list should be distributed to all Waste Management supervisors and senior management in the municipality. This list should be updated annually or when staff changes occur.	High	X	X	X	X	X	Nil. Internal project	N/A
2.5	Training: Develop an annual training plan with proposed dates for training for all staff included in the revised organogram. The training plan to be revised annually. Provide biennial training on the Waste Management By-laws to all persons involved in enforcing by-laws according to the enforcement plan developed. All technical staff to attend a waste training course, as appropriate, and to be revised on at least a 5 year cycle. Waste Management Officer to attend the provincial training provided for reporting on SAWIS.	Medium	X	X	X	X	X	R50,000 per year	N/A
2.6	Induction training: All new staff to undergo technical training within 6 months of appointment.	High		X	X	X	X	Nil. Internal project	N/A
2.7	IWMP implementation and annual reports: The implementation plan should be distributed to all persons responsible for managing projects / programs in the implementation plan. Undertaken an annual review of progress against the IWMP implementation plan and compile annual progress reports in accordance with the	High	X	X	X	X	X	Nil. Internal project	N/A

No.	Actions	Priority Rating	2019/20	2020/21	2021/22	2022/23	2023/24	Funding: cost	Funding: source
	requirements of Section 13 of the Waste Act.								
2.8	Waste infrastructure Masterplan: compile a masterplan for waste management facilities and infrastructure that is required for the MLM, and where the best strategic locations for establishing this infrastructure are. The study should include identification of potential sites considering landownership and development, as well as costs associated with development and management of these facilities. Facilities include: • Development of drop-off centres for general waste, garden waste and builder's rubble • Development of transfer stations • Development of MRFs • Development of buy-back centres • Development of composting facilities. The waste infrastructure masterplan should be undertaken as a once-off exercise but before the end of the 2022/2023 financial year.	High		X	X	X		R350,000	TBC
OBJECTIVE 3: Waste information management									
3.1	Establish an appropriate Waste Information System for sourcing, collating, storing and reporting required information for waste collection services including: • Information required in terms of the by-laws. • Waste collection tonnages • Disposal certificates • Facility permits. • Data capturing and reporting procedure for recycled waste tonnages of businesses and industrial business. This includes the registering of these companies on the SAWIS as per the regulations of the Waste Information Regulations. The	High	X	X				Nil. Internal project	N/A

No.	Actions	Priority Rating	2019/20	2020/21	2021/22	2022/23	2023/24	Funding: cost	Funding: source
	information of recycled waste to be collated from 2020. The WIS to be developed by 2020/2021 financial year and updated annually where required.								
3.2	Capture historical tonnage data (at least past 2 years) for waste disposed of at the King Cetshwayo regional landfill site and develop an information list of tonnages of waste collected within the MLM and disposed of.	High	X					Nil. Internal Project	N/A
3.3	Review the Waste Information Regulations and comply. The activities to comply to be undertaken on an annual basis.	High	X	X	X	X	X	Nil. Internal Project	N/A
3.4	Register the MLM on SAWIS and verify tonnages on a quarterly basis.	High	X	X	X	X	X	Nil. Internal Project	N/A
3.5	Review of complaints management system: Update the complaints register used by the MLM. All complaints should be logged electronically and details of actions taken to address complaints should be registered.	Medium	X	X	X	X	X	Nil. Internal Project	N/A
3.6	Undertake bi-annual (every 6 months) characterisation of domestic waste stream.	High	X	X	X	X	X	Nil. Internal Project	Internal budget
OBJECTIVE 4: Waste Minimisation and Recycling									
4.1	In-house recycling for municipal offices: The MLM should expand the in-house paper recycling programme to other waste types and other offices within the MLM. Non-municipal offices should be considered as well for this. A contractor should be appointed to collect paper and shredded paper from all municipal offices.	High	X	X	X	X	X	TBC. Internal project	Internal budget
4.2	Waste minimisation projects: Introduce one waste minimisation project that facilitates creation of jobs in waste management (IDP project).	High		X	X	X	X	To be estimated according to project scope. Internal project.	Internal budget

No.	Actions	Priority Rating	2019/20	2020/21	2021/22	2022/23	2023/24	Funding: cost	Funding: source
4.3	Encourage participation of SMME's and Co-operatives in waste recycling and re-use (IDP objective) by: • Assisting local recyclers. • Assisting community re-use and recycling projects. • Assist at least one local recycling / re-use business per year by providing support such as assisting with the development of business plans, information on recycling network within the iLembe District Municipality, and applications for funding. • Assist at least one community re-use or recycling project per year by providing support such as assisting with project advertising or sponsorship of equipment.	Medium	X	X	X	X	X	To be estimated according to project scope. Internal project.	Internal Budget
4.4	Management of reclaiming: Formalise and document all waste reclaiming and recycling activities by the end of 2021/2022 financial year (IDP project). List to be updated annually thereafter.	Medium		X	X	X	X	Nil. Internal.	N/A
OBJECTIVE 5. Waste Collection and Storage									
5.1	Undertake an annual collection route optimisation exercise for urban, peri-urban and rural areas to ensure that collections are being undertaken efficiently as possible from the beginning of the 2019/20 financial year.	High	X	X	X	X	X	Nil. Internal.	N/A
5.2	Expansion of waste collection services: Compile a documented plan for expanding waste collection services to accommodate new settlement developments being built, increasing the waste collection service to rural areas and placing communal skips at dumping hotspots. This should indicate target expansion areas, anticipated timeframes and associated costs. Plan should be updated annually.	High	X	X	X	X	X	Nil. Internal project	N/A
5.3	Conduct an annual mapping exercise for the placement of skip bins in rural areas based on population densities and in areas where the skips are accessible to waste collection vehicles (waste compactor truck).	High		X	X	X	X	Nil. Internal project	Internal Budget

No.	Actions	Priority Rating	2019/20	2020/21	2021/22	2022/23	2023/24	Funding: cost	Funding: source
5.4	Vehicle and equipment management, maintenance and replacement roster: A vehicle and equipment management, maintenance and replacement roster is to be developed for all waste collection vehicles to ensure they remain operational and that new waste collection vehicles are procured. Plan to be reviewed annually.	High	X	X	X	X	X	Nil. Internal project	N/A
OBJECTIVE 6: Waste Transfer and Disposal									
6.1	As part of the waste infrastructure master plan, the MLM should investigate the possibility and terms of agreement for the utilisation of the Sappi Tugela Landfill Site and the Dolphin Coast Landfill Site in KwaDukuza for the disposal of general waste and the iSithebe Industrial Estate transfer station for the disposal recyclable waste by waste reclaimers. The MLM to conduct a cost comparison of utilising these facilities at a cost determined by these organisations to establishing these facilities within the MLM.	High	X	X				To be estimated according to project scope and terms of agreement.	Internal budget
6.2	Develop, or secure public access to, a drop off centre or transfer station for the disposal of excess general waste, garden waste and builder's rubble by the end of the 2021/2022 financial year. To be included as part of the waste infrastructure masterplan.	High		X	X	X		To be estimated according to project scope	Grant funding
OBJECTIVE 7: Waste Management Awareness									
7.1	Programme awareness campaign: Establish an annual programme of awareness campaigns at the beginning of each year. Residential areas around the illegal dumping sites should be prioritised for awareness campaigns. Waste by-laws should be communicated through these campaigns, once finalised.	High	X	X	X	X	X	Nil. Internal project	Internal project
7.2	Waste handling leaflet: Compile a "how to handle to your" information leaflet which address: • The relevant municipal departments and key contacts. • Kerb-side collections: What is acceptable, what is not and how to tell the difference.	Medium		X			X	R20k for year leaflet is developed.	Internal budget

No.	Actions	Priority Rating	2019/20	2020/21	2021/22	2022/23	2023/24	Funding: cost	Funding: source
	• Recycling: What is recyclable, separating at source, and where to drop-off. • Hazardous waste: What to do with your hazardous domestic waste. • Illegal dumping, by-laws and the applicable fines. • Public waste management facilities such as transfer stations. The information should be available on the MLM website. Update this every 3 years.								
7.3	Waste education: Plan waste education initiatives for schools and communities and facilitate and conduct the initiative in at least four schools and four community groups in the MLM annually. These education initiatives to be documented.	High	X	X	X	X	X	R50k, if done by MLM	Internal budget
OBJECTIVE 8: Waste Management By-Laws and Compliance with Waste Legislation									
8.1	Develop an enforcement plan to guide the process of enforcing waste by-laws. It should consider fining protocols, how to apply penalties and recovery systems and general involvement of peace officers. The enforcement plan to be reviewed every two years if required.	High		X		X		Nil. Internal Project	Internal budget
8.2	Create one new Waste Ranger position and fill it.	High		X				Salary to be confirmed	Internal budget
8.3	Provide bi-annual (every six months) training on the Waste Management By-laws to all existing MLM Peace Officers.	High		X	X	X	X	Nil. Internal project	Internal budget
8.4	Run a campaign to ensure all waste service providers are registered in terms of the by-laws.	High	X	X	X	X	X	Nil. Internal.	N/A
OBJECTIVE 9: Illegal Dumping									
9.1	Undertake a dumping hotspot assessment and update this annually. This map-based study of illegal dumping hotspots will assist to determine remediation costs.	High	X	X	X	X	X	Nil. Internal.	TBC

No.	Actions	Priority Rating	2019/20	2020/21	2021/22	2022/23	2023/24	Funding: cost	Funding: source
9.2	Conduct dumping hotspot cleaning campaigns and remediate existing hotpots. Reduce the number of hotspots by 50% by 2024.	High		X	X	X	X	R250k/yr Internal project	Internal budget
9.3	Implement dumping prevention measures (e.g. signage, barriers, awareness campaigns near dumping hotspots, etc.).	High	X	X	X	X	X	R100k/yr Internal project.	Internal budget

7 Conclusion and Way Forward

GIBB has compiled this Integrated Waste Management Plan (IWMP) for the Mandeni Local Municipality as a baseline document which would assist municipal officials in their planning to achieve integration of the local municipal solid waste management service in terms of their legislative obligations.

The IWMP provides an overview of the context within which waste management, and more specifically solid waste management, takes place within the MLM. This context covers the regulatory function relating to the operational, financial, legal and institutional dimension; situational analysis of the socio-economic demographics and current waste management activities within the MLM; as well as a waste management gap and needs analysis. The identified gaps and needs were then evaluated and translated into objectives and targets which culminated into an Implementation Plan with recommended priority ratings and timeframes for implementation.

Although much of the strategy and preliminary action plan presented in this report has been derived from initial discussions with the representatives of the environmental and waste management department within the Community Services Division, a draft document was presented, discussed and workshopped with key municipal and relevant project stakeholders at various meetings and workshops. The strategy was then amended and refined to ensure its full acceptance and subsequent adoption.

The key identified gaps and needs are summarised as follows:

- A Waste Management Officer (WMO) needs to be formally designated.
- The waste management department organogram needs to be reviewed and vacant posts should be filled.
- Waste information management is week, and a comprehensive waste information system needs to be set in place.
- Recycling, waste minimisation and re-use initiatives must be promoted and implemented.
- Collection services need to be extended where possible to the peri-urban areas.
- A cost comparison needs to be conducted for disposal of waste at the Sappi Tugela Landfill Site in Mandeni, the Dolphin Coast Landfill Site in KwaDukuza Local Municipality and the King Cetshwayo regional landfill site in the King Cetshwayo District Municipality. The study should consider the travelling costs for waste collection vehicles and the maintenance and replacement costs of these vehicles as well.
- The Municipality needs to provide waste drop off centres for excess domestic general waste, garden

refuse, builder's rubble and domestic hazardous waste within densely populated areas. This is to minimize the illegal dumping within the MLM, promote proper waste disposal and provide facilities for recycling in the MLM.

- The Municipality needs to initiate a series of awareness programmes in order to inform residents of waste services, recycling, waste minimisation initiatives and enforcement of by-laws.
- Tariffs and waste management budgets (capital and operational costs) need to be revised to ensure the implementation of projects detailed in the IWMP and the AMP.

This IWMP presents a 5 year plan for the implementation of projects to address the needs outlined above. These projects are important for realising the required improvements. Nonetheless, it must be recognised that the IWMP should be considered a 'living document' that would require update from time to time as the local dynamics change.

7.1 Approvals

This IWMP will require council approval prior to it being adopted and implemented by the Community Services directorate. The plan will also, as required by Chapter 3 of the National Environmental Management: Waste Act (59 of 2008), require endorsement by the provincial environmental Member of Executive Council. The submission of the final IWMP to the MEC of EDTEA and the MEC for Local Government for endorsement is dependent on, primarily, the necessary municipal channels having been followed, in terms of Section 29 of the Municipal Systems Act (32 of 2000).

7.2 Public Participation

The Municipal Systems Act contains extensive provisions pertaining to public participation. This IWMP should be subject to an appropriate Public Participation Process (PPP) before it is accepted as final by the MLM council.

8 Monitoring Plan

Regular and ongoing monitoring of the IWMP is required to ensure the objectives of the IWMP are accomplished. Monitoring of the success of projects during the IWMP implementation phase will ensure that corrective action is taken when necessary.

There is a legal requirement under section 13(2) of NEM:WA for reports on IWMP implementation to be compiled. The reports must present:

a. the extent to which the plan has been implemented during the period;
b. the waste management initiatives that have been undertaken during the reporting period;
c. the delivery of waste management services and measures to be taken to secure the efficient delivery of waste management services, if applicable
d. the level of compliance with the plan and any applicable waste management standards;
e. the measures taken to secure compliance with waste management standards;
f. the waste management monitoring activities;
g. the actual budget expended on implementation of the plan;
h. the measures that have been taken to make any necessary amendments to the plan;
i. in case of a province, the extent to which municipalities comply with the plan and in the event of a non-compliance with the plan, the reasons for such a non-compliance

8.1 IWMP Close-out Report

A close out report should be completed at the end of 2024 to summarise the implementation of projects for the period 2019 - 2024. This report should describe which projects have been completed, which have been implemented and which have not been implemented. The success of these projects should be documented as well.

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Appendix A

Policy and Legislation

10 Policy and Legislation

10.1 Introduction

South Africa has a host of legislated acts, policies and guidelines relating to waste management, the most significant of these being the newly promulgated National Environmental Management: Waste Act (58 of 2008) which is now the countries central piece of legislation dealing with waste management. There are also certain relevant international conventions to which South Africa subscribes. This section discusses these acts, policies, guidelines and conventions thereby providing a context to waste policy and legislation. Where applicable it highlights aspects of these acts and policies which apply specifically to the local government authorities.

This section is not exhaustive but presents the broader legislative framework and highlights the more important aspects thereof.

10.2 International conventions

10.2.1 Basel Convention on the control of trans-boundary movement of hazardous wastes and their disposal

The Basel Convention (1989) is a global agreement which seeks to address the trans-boundary movement of hazardous waste. The convention is centred on the reduction of the production of hazardous waste and the restriction of trans-boundary movement and disposal of such waste. It also aims to ensure that strict controls are in place when any trans-boundary movement and disposal of hazardous waste does occur, and ensures that it is undertaken in an environmentally sound and responsible manner.

The Basel Convention, held on 22 March 1989, came into effect during May 1992 after ratification by the prerequisite number of countries. South Africa ratified the Convention in 1994, with DEA being the focal point for the convention. Whilst South Africa subsequently acceded to this Convention, no legislation was passed at the time to give effect to it. The second Basel convention, held on 8 October 2005, set standards for the control of trans-boundary movements of hazardous wastes and their disposal, setting out the categorization of hazardous wastes and the policies for their disposal between member countries. South Africa accedes to this convention and implements its provisions.

The key objectives of the Basel Convention are:

- To minimise the generation of hazardous wastes in terms of quantity and hazardousness.
- To dispose of hazardous waste as close to the source of generation as possible.

- To reduce the movement of hazardous wastes.
- Locally, draft regulations are being prepared in an effort to control the movement of such waste.

The most significant provisions of the Convention relate to the ban on certain importations and exportations; illegal traffic, bilateral, multilateral and regional agreements and the control system of the Convention.

The Basel Convention contains specific provisions for the monitoring of implementation and compliance. A number of articles in the Convention oblige parties (national governments which have acceded to the Convention) to take appropriate measures to implement and enforce its provisions, including measures to prevent and punish conduct in contravention of the Convention.

10.2.2 Rotterdam Convention

The Rotterdam Convention was held in September 1998 to promote shared responsibilities in relation to importation of hazardous chemicals. One of the key provisions is the Prior Informed Consent procedure, which lists information on hazardous chemicals in Annex III. It became legally binding for its parties in 2004. The convention promotes open exchange of information and calls on exporters of hazardous chemicals to use proper labelling, include directions on safe handling, and inform purchasers of any known restrictions or bans. Parties can decide whether to allow or ban the importation of chemicals listed in the treaty, and exporting countries are obliged to make sure that producers within their jurisdiction comply. From this convention a PIC circular is distributed every six months giving updated information on the listed chemicals, member compliance and sources of supporting information.

10.2.3 Stockholm Convention

In 1995 the United Nations Environment Programme called for global action to be taken on persistent organic pollutants (POPs), which pose a threat to both health and the environment. As a result, the negotiations for the Stockholm Convention on POPs were initiated and culminated in May 2001, with the convention enforced in May 2004. South Africa accedes to this convention, whereby member countries have agreed to phase out POPs, and prevent their import or export. It imposes restrictions on the handling of all intentionally produced POPs, i.e. identified highly toxic, persistent chemicals.

The 12 POPs that have been identified under the convention are aldrin, chlordane, dieldrin, dichloride-diphenyl-trichloroethane (DDT), endrin, Hexachlorobenzene (HCB), heptachlor, mirex, polychlorinated biphenyls (PCBs), toxaphene, dioxins, and furans. Of the aforementioned substances, two are still used in South Africa today (DDT and PCBs), although their use is restricted under the ‘Fertiliser Act’ as

administered by the Department of Agriculture. The above list of chemicals is relevant, especially where there is any management of obsolete and banned pesticides.

South Africa negotiated the continued use of DDT, as it has proved critical in the fight against malaria, and PCBs will be phased out as the electrical appliances that contain them become obsolete.

In 2005 South Africa, at the Reduce, Reuse and Recycle Ministerial Conference, became one of 7 countries to sign an agreement for the African Stockpile Programme, a project aimed at recovering and the appropriate disposal of obsolete pesticides. With funding ($1,7million) from the World Bank, government began implementing the programme.

The country is also developing guidelines for the implementation of the Globally Harmonised System of Classification and Labelling of Chemicals. The funding was for the disposal of obsolete pesticides as part of the African Stockpile Programme. The department has begun implementing this programme throughout the country. Further work on training workers to handle chemicals was rolled out.

By mid-2007, a pilot project for the collection of all obsolete pesticides possessed by farmers in the Limpopo Province had begun, and this involved, amongst others, identification of collection points and collection of obsolete pesticides within the province. These stocks were further consolidated from various collection points to a central collection point and ultimately safeguarded and shipped to Holfontein Waste Disposal Site for temporary storage. The inventory of pilot project stocks has been undertaken. About 100 tons of labelled and unlabelled stocks of obsolete pesticides have been collected through this pilot project. The pilot project is expected to serve as a benchmark for the roll-out of projects in other provinces.

However, as the amount of obsolete pesticide stocks collected from the Limpopo pilot project is significantly higher than what was anticipated, it has become apparent that the remaining funds in the World Bank African Stockpile Programme budget will not be sufficient for national rollout of the programme. The African Stockpile Programme Project Management Unit has had numerous deliberations in an effort to come up with a sustainable solution for management of pesticides in the country1.

[1] For more information contact Ms. Nomphelo Daniel, Tel: 012 310 3904, email: ndaniel@deat.gov.za

10.2.4 London Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matters

The London Convention on the Prevention of Marine Pollution by Dumping of Waste and Other Matter, 1972, aims to prevent marine pollution by preventing the dumping of wastes such as industrial waste, sewage sludge, dredged material and radioactive waste at sea, as well as incineration at sea. South Africa is a signatory to the convention and the associated 1996 Protocol.

This convention and its various protocols were incorporated into the following South African legislation:

- Prevention of Pollution from Ships Act (Act 2 of 1986), and the regulations concerning the Prevention of Pollution by Garbage from Ships Regulations (GN R1490, published in Government Gazette No. 14000, dated 29 May 1992).
- The Dumping at Sea Control Act (Act 73 of 1980).

The primary responsible agency is the DEAT Sub Directorate of Marine and Coastal Pollution Management who issue permits for dredge spoils and sinking of old vessels. It occasionally issues permits for ships in trouble, typically grounded, to release their cargo into the sea.

10.2.5 Local Agenda 21

Agenda 21 is a comprehensive document for global action on the environment and sustainable development, to take the world into a more sustainable 21st century. It is probably the most important document to be adopted by the UN Conference on the Environment and Development (UNCED) at the Rio de Janeiro Summit in June 1992. The 40 chapters covered a wide range of issues including the atmosphere, oceans, land resources, poverty, etc.

It was important for each nation to develop its own local Agenda 21, in order to translate and interpret the principles of sustainable development to local areas. Local Agenda 21 focuses on developing partnerships involving the public, private and community sectors that together can resolve urban environmental management problems and strategically plan for long term sustainable environmental management.

One of the key features of sustainable development is the requirement to integrate economic and environmental factors into all decision making processes. Applications of these criteria to waste management require a new emphasis on resource and energy conservation, ensuring that supplies of raw materials, sources of energy and the quality of the physical environment can be maintained. Agenda

21 initiatives are considered to be an essential vehicle for the implementation of various aspects of the IWMP.

The key goals of Agenda 21 are:

- Sustainable development.
- Eradication of poverty.
- Elimination of threats to the environment.
- To ensure a sustainable environment.
- Creation of sustainable job opportunities.

The focus of the IWMP is to strive to attain the above goals in all facets thereof. The following seven key activities require attention in order to satisfy Local Agenda 21.

(a) **Activities within the Local Authority**

(i) Garnering local political support

- Information sessions and workshops.
- Reports and presentation to committees.
- Physical involvements in projects.

(ii) Managing and improving local authorities own environmental performance.

- Corporate commitment.
- Staff training and creating awareness.
- Environmental management systems.
- Budgeting for environmental processes.
- Policy integration across all sectors.

(iii) Integrating sustainable development aims within local authorities' policies and activities

- Economic development.
- Tendering and purchasing.
- Tourism and visitor strategies.
- Health strategies.

- Welfare, equal opportunities and poverty strategy.
- Focused environmental services.

(a) **Activities within the wider community**

(iv) Awareness raising and education

- Support for environmental education.
- Awareness-raising events.
- Visits and talks.
- Support for voluntary groups.
- Publication of local information.
- Press releases.
- Initiatives to encourage behavioural change and practical actions.

(v) Consulting and involving general public

- Public consultation processes.
- Interaction with NGO's/forums.
- Focus groups.
- Feedback mechanisms

(vi) Forging partnerships with other interest groups and activities, such as:

- Meetings, workshops and conferences.
- Working groups/advisory groups.
- Round table discussions.
- Comprehensive Urban Plan.
- International and regional partnerships.

(vii) Measuring, monitoring and reporting on progress toward sustainability

- Environmental monitoring.
- Sustainability indicators.
- Targets.
- Environmental Impact Assessments.

- Strategic Environmental Assessment.

10.3 South African Legislation

10.3.1 Constitution of the Republic of South Africa

The South African Constitution (Act 108 of 1996) is the supreme law of South Africa. Any law or conduct that is inconsistent with it, is invalid, and the obligations imposed by it must be fulfilled. Therefore, as such, all law, including environmental and waste management planning must consider compliance with the Constitution of South Africa.

The Constitution contains a Bill of Rights, set out in Sections 7 to 39. The Bill of Rights applies to all law and binds the legislature, the executive, the judiciary and all organs of state. A provision of the Bill of Rights binds a natural or a juristic person if, and to the extent that it is applicable, taking into account the nature of the right and the nature of the duty imposed by the right.

Section 24 of the Constitution guarantees everyone the right to:

An environment that is not harmful to their health or wellbeing; and to have an environment protected for the benefit of present and future generations, through reasonable legislative and other measures that:

- Prevent pollution and ecological degradation.
- Promote conservation. and
- Secure ecologically sustainable development and use of natural resources while promoting justifiable economic or social development.

The environmental rights (section 24), is strengthened by other relevant fundamental rights, such as the rights of access to information and administrative justice.

(b) **National and Provincial authority competence**

General obligations imposed by the constitution on national and provincial government institutions are adjudicated, as the Constitution establishes an administrative framework for all organs of state. The national and provincial governments are concurrently entitled to legislate on matters stipulated in Schedule 4 of the Constitution. Both spheres of government have legislative competence over areas that will impact on management in the natural/urban interface, like environment, disaster management, nature conservation and pollution control, and would therefore also frame related matters such as waste

management. It should also be noted that the Constitution contemplates the assignment, from national Government to the provinces, of functions that would normally be the exclusive preserve of the former.

Subsection 24(b) of the Constitution relates to the constitutional imperative requiring government to enact appropriate environmental law reform legislation. This led to the promulgation of the National Environmental Management Act (Act 107 of 1998, NEMA)2 and the National Water Act (Act 36 of 1998)3 amongst others. More specifically to the objective of this framework is the National Environmental Management: Waste Act, which was recently enacted4.

Important to the development of a local integrated waste management strategy and plan is that in accordance with Section 155(6) of the Constitution each provincial government must establish municipalities in its province and, by legislative or other measures, must –

(1) provide for the monitoring and support of local government in the province; and
(2) promote the development of local government capacity to enable municipalities to perform their functions and manage their own affairs.

Furthermore in according to Section 155(7) the national government and the provincial governments have the legislative and executive authority to see to the effective performance by municipalities of their functions in respect of matters listed in Schedules 4 and 5, by regulating the exercise by municipalities of their executive authority referred to in section 156 (1).

(c) **Local authority competence**

National and provincial government are both obliged, by legislative and other measures, to support and strengthen the capacity of municipalities to manage their affairs, to exercise their powers and perform their functions within the individual municipal jurisdiction. This responsibility is covered in Chapter 7:

In terms of section 152 of the Constitution the objects of local government are to:

- Provide democratic and accountable government for the local community.

- Ensure the provision of services to communities in a sustainable manner.
- Promote social and economic development.
- Promote a safe and healthy environment. and
- Encourage the involvement of communities and community organisations in the matters of local government.

A municipality must in terms of section 153 structure and manage its administration and budgeting and planning processes to give priority to the basic needs of the community and participate in national provincial development programmes.

National and provincial government are also obliged to assign to a municipality, by agreement and subject to any conditions, the administration of matters listed in the relevant parts of Schedules 4 and 5 and any other matter which would be most effectively administered locally, provided that the municipality has the capacity to administer it. A municipality has the right to exercise any power concerning a matter reasonably necessary for, or incidental to, the effective performance of its functions.

Those areas of the urban/natural interface zone that fall within the legislative and jurisdictional competence of provincial or local authorities (for example a road reserve or urban areas that border a park) fall to be regulated by those authorities. The Constitution aims to co-ordinate the different levels of government and the management of the issues which the public institutions constituted or confirmed by them are charged with governing. This requires co-operation on the part of different organs of state. The above statements become pertinent to waste management as it sets the context of the administrative activities convened at the Local government level. In addition, related to local government in terms of section 152(1)(d) of the constitution, one of the objectives of local government is “to promote a safe and healthy environment”.

Municipalities are further charged with making, administering and enforcing by-laws for the effective administration of the matters of which they have the right to administer. Any bylaw that conflicts with national or provincial legislation is deemed invalid. In accordance with Section 160(4) no bylaw may be passed by a Municipal Council unless all the members of the Council have been given reasonable notice; and the proposed by-law has been published for public comment. Furthermore, in accordance with Section 162 no bylaw may be enforced unless it has been published in the relevant official provincial gazette and the bylaw must be accessible to the public.

10.3.2 National Environmental Management Act

The National Environmental Management Act (Act 107 of 1998) commonly known as “NEMA” gives effect to the “Environmental Right” of the Constitution and is South Africa’s overarching framework for environmental legislation. The objective of NEMA is to provide for operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance, and procedures for co-ordinating environmental functions exercised by organs of state. An important function of the Act is to serve as an enabling Act for the promulgation of legislation to effectively address integrated environmental management.

NEMA sets out a number of principles that aim to implement the environmental policy of South Africa. These principles are designed to serve as a framework for environmental planning, as guidelines by which organs of state must exercise their functions and to guide other laws concerned with the protection or management of the environment.

The principles include a number of internationally recognized environmental law norms and some principles specific to South Africa. These core principles include:

- Accountability
- Affordability
- Cradle to Grave Management
- Equity
- Integration
- Open Information
- Polluter Pays
- Subsidiary
- Waste Avoidance and Minimisation
- Co-operative Governance
- Sustainable Development
- Environmental Protection and Justice

Chapter 2: Sections 3 to 6 of NEMA, make provision for the establishment of the Committee for Environmental Co-ordination. The objective of the committee is to promote the integration and co-ordination of environmental functions by the relevant organs of state and in particular to promote the

achievement of the purpose and objectives of environmental implementation plans and environmental management plans.

Chapter 5: Sections 23 to 24 of NEMA is designed to promote integrated environmental management and provide tools for integrating environmental activities. Environmental management must place people and their needs at the forefront of its concerns, and serve their physical, psychological, developmental, cultural and social interests equitably. This chapter of NEMA requires any activity that can potentially impact on the environment, socio-economic conditions and cultural heritage require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by the law with authorising, permitting or otherwise allowing the implementation of an activity. Development must be socially, environmentally and economically sustainable. Sustainable development therefore requires the consideration of all relevant factors, some of which include the following:

- The disturbance of ecosystems and loss of biological diversity is to be avoided, or, minimised and remedied.
- The pollution and degradation of the environment are to be avoided, or, minimised and remedied.
- Waste is to be avoided, or, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner.
- A risk-averse and cautious approach is to be applied.
- Negative impacts on the environment and on the people's environmental rights must be anticipated and prevented, and where they cannot be altogether prevented, must be minimised and remedied.

Section 24(5) of NEMA was enacted through the promulgation of the Environmental Impact Assessment (EIA) Regulations published in 2006 and revised in 2010. The construction of facilities or infrastructure including associated structures or infrastructure for the recycling, re-use, handling, temporary storage or treatment of general waste and hazardous waste, were originally listed in these regulations and therefore required either a Basic Assessment or a Scoping and EIA Process to be followed depending on specific listed criteria. However, the above mentioned waste activities have now been repealed and instead require a license application under the Waste Act.

Chapter 7: Sections 28 to 30, imposes a duty of care in respect of pollution and environmental degradation. Any person who has caused significant pollution or degradation of the environment must take steps to stop or minimise the pollution. Where an incident occurs that is potentially detrimental to the environment, the person who is responsible for the incident or the employer must, within 14 days of the incident, report to the Director-General, provincial head of department and municipality. The relevant

authority may specify measures to address the problem and remediate the area within 7 days. The Acts also attach consequences for breaching the duty of care, namely that government authorities are empowered to issue directions and to remediate the situation and recover costs where the directions are not complied with.

Chapter 8: Sections 35, provides that the Minister and every MEC and municipality may enter into an environmental management co-operation agreement with any person or community for the purpose of promoting compliance with the principals laid down in NEMA. Environmental Co-operation Agreements may contain an undertaking by the person or community concerned to improve the standards laid down by law for the protection of the environment and a set of measurable targets and a timeframe for fulfilling the undertaking.

Chapter 9 allows the Minister to make model By-Laws aimed at establishing measures for the management of environmental impacts of any development within the jurisdiction of the municipality, which may be adopted by the municipality as By-Laws. Any municipality may request the Director-General to assist it with its preparation of By-Laws on matters affecting the environment and the Director-General may not unreasonably refuse such a request. The Director-General may institute programmes to assist municipalities with the preparation of By-Laws for the purposes of implementing this Act.

10.3.3 Environment Conservation Act

The Environment Conservation Act (Act 73 of 1989) (ECA) predates the Constitution and, although many sections have already been repealed, certain sections are still in place.

The objectives of the ECA are to provide for the effective protection and controlled utilisation of the environment. Several sections of the ECA were repealed through the enactment of NEMA and certain responsibilities were assigned to the provinces.

The Waste Act has repealed sections of the ECA dealing with waste management. More specifically these repealed sections are:

- 19: Prohibition of littering. This is now dealt with under Section 27 of the Waste Act.
- 19A: Removal of litter.
- 20: Waste Management. This section dealt with permitting of waste facilities, but is now replaced by Chapter 5 (Sections 43 – 59) of the Waste Act.

Waste management, more specifically with regard to landfill disposal site permitting and related matters, was until its recent repeal through the Waste Act, coordinated and controlled under Section 20 of the ECA, as follows.

In order to implement section 20 of the ECA, DWAF previously issued the above mention permits subject to specified conditions stipulated in the DWAF Minimum Requirements: Waste Management Series5.

- 24: This section provided the framework for waste regulations to be formulated. This issue is now covered by Chapter 8, Part 1 (Regulations) (Sections 69 – 71) of the Waste Act.
- 24A, 24B and 24C: Similarly these sections which dealt with regulations regarding littering, products, and procedures for making regulations respectively are now addressed by Chapter 8, Part 1 of the Waste Act.
- 29: Sections (3) and (4), which deal with Offences and Penalties have been substituted by the Waste Act.

Despite the fact that the Waste Act repeals section 19,19A, 20, 24, 24A 24B, and 24C of the ECA, it should be noted that in accordance with Section 80(2) of the Waste Act, any regulations or directions made in terms of these appealed sections of the ECA, remain in force and are considered to have been made under the Waste Act.

10.3.4 National Environmental Management: Waste Act

(d) **Overview**

The National Environmental Management: Waste Act (Act 59 of 2008) (NEMWA) was promulgated on 01 July 2009, marking a new era in waste management in South Africa (with the exception of a number of sections which will be brought into effect at dates still to be gazetted). The act covers a wide spectrum of issues including requirements for a National Waste Management Strategy, IWMPs, definition of priority wastes, waste minimisation, treatment and disposal of waste, Industry Waste Management Plans, licensing of activities, waste information management, as well as addressing contaminated land.

However, South African waste management legislation is still fragmented. Mining; radio-active waste; disposal of explosives; and disposal of animal carcasses, which are covered by specific other regulations is not addressed by the act. The Waste Act does however constitute South Africa's overarching primary waste legislation.

5

(e) **Objectives of the Waste Act**

The National Environmental Management: Waste Act's objectives are -

To protect health, well-being and the environment by providing reasonable measures to -

- Minimising the consumption of natural resources.
- Avoiding and minimising the generation of waste.
- Reducing, re-using, recycling and recovering waste.
- Treating and safely disposing of waste as a last resort.
- Preventing pollution and ecological degradation.
- Securing ecologically sustainable development while promoting justifiable economic and social development.
- Promoting and ensuring the effective delivery of waste services.
- Remediating land where contamination presents, or may present a significant risk of harm to health or the environment. and
- Achieving integrated waste management reporting and planning.
- To ensure that people are aware of the impact of waste on their health well-being and the environment.
- To provide for compliance with the measures set out in paragraph (a) and
- Generally, to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

The Chapters and topics of the Waste Act are as follows:
Chapter 1 - Interpretation and Principles
Chapter 2 - National Waste Management Strategy, Norms and Standards
Chapter 3 - Institutional and Planning Matters
Chapter 4 - Waste Management Measures
Chapter 5 - Licensing of Waste Management Activities
Chapter 6 - Waste Information
Chapter 7 - Compliance and Enforcement
Chapter 8 - General Matters.

(f) **Roles and Responsibility**

The Act establishes a national framework for waste planning, regulation and management with roles for all spheres of government, specifically:

- National government is tasked with establishing a national waste management strategy, including

norms, standards and targets. National norms and standards may cover all aspects of the waste value chain, from planning to service delivery. Of particular importance from an intergovernmental perspective are the powers of national government with respect to norms and standards for:

- The regionalization of waste management services.
- Tariffs for waste services provided by municipalities, including providing for tariffs to be imposed to provide for waste management infrastructure or facilities and ensuring that funds obtained from the provision of waste services are used for the delivery of these services.
- Provincial governments are tasked with the implementation of the national waste management strategy and national norms and standards, and may set additional, complementary provincial norms and standards. The Waste Act notes that these norms and standards must amongst other things facilitate and advance regionalization of waste management services.
- Local governments are required to ensure the universal and sustainable delivery of services, subject to national and provincial regulation. In particular, they are required to maintain separate financial statements, including a balance sheet of the services provided.

The table below lists sections of the act which make specific demands on Local (municipal) government: Tasks falling under sections of the act which have yet to be enacted have not been listed. While certain sections of the text are taken verbatim from the Act, interpretation has been added.

Table 49: Tasks required by MLM in terms of NEM:WA.

TOPIC	SECTION	REQUIREMENT
General duty	3	The state **must** put in place measures that seek to reduce the amount of waste generated, and where waste is generated, ensure that it is re-used, recycled and recovered in an environmentally sound manner.
Waste service standards	9 (1) & (2)	The municipality must deliver waste management services, including waste removal, storage and disposal services in adherence to the national and provincial norms and standards (section 7 and 8 of the Act); whilst: • Integrating the IWMP and IDP • Ensuring access to services • Ensuring affordable service delivery • Ensure effective and efficient Sustainable and Financial management
	9 (3)	The Municipal may furthermore set local standards: • For separating, compacting and storing waste • Management of solid waste, i.e.: Avoidance, Minimisation, Recycling • Coordination of waste to relevant treatment or disposal facilities • Litter control
Designation of Waste Management Officers	10(3)	The Municipality must designate in writing a waste management officer from its administration to be responsible for coordinating matters

TOPIC	SECTION	REQUIREMENT
		pertaining to waste management in that municipality
Integrated Waste Management Plans	11 (4) & (7)	• The Municipality must submit an IWMP to the MEC for approval (response from the MEC must be given within 30 days) • Include the approved IWMP into its IDP • Follow the consultative process in section 29 of the Municipal Systems Act (separately or as part of IDP)
	12	Contents for IWMP's, includes: • A situational analysis • a plan of how to give effect to the Waste Act • municipal waste management and services obligations • prioritisation of objectives • setting of targets • planning approach to any new disposal facilities; and • Financial resourcing.
	13	An annual performance report prepared in terms of section 46 of the Municipal Systems Act must contain information on the implementation of the municipal IWMP.

(g) **Industry Waste Management Plans**

For industries, the Waste Act states that either the Minister or the relevant provincial MEC may under certain conditions and by written notice or by notice in the Gazette require a person or industry to prepare and submit an Industry Waste Management Plan.

(h) **Waste Licensing for listed Activities**

The Minister has subsequently gazetted (on 03 July 2009) GN No. 718 (Gazette No. 32368) and 719 (Gazette No. 32369) which present a Waste Management Activity Lists describing those waste activities, and thresholds, which require authorisation before they are undertaken. This list was amended in 2013 (Gazette No 921 of 2013). The Waste Act Schedule 1 (Section 19) identifies activities which require a waste management licence. Activities include:

- Storage and transfer of waste.
- Recycling and recovery.
- Treatment of waste.
- Disposal of waste on land.
- Construction, expansion or decommissioning of facilities and associated structures and infrastructure.

Either a Basic Assessment or Scoping and Environmental Impact Assessment (EIA) process is to be carried out with regards to acquiring a licence as stipulated in the environmental impact assessment regulations made under section 24 (5) of the Waste Act).

(i) **Integrated Waste Management Planning**

The Waste Act also places considerable emphasis on the development of an integrated waste planning system, through the development of interlocking Integrated

Waste Management Plans (IWMPs) by all spheres of government and specified waste generators. This planning system is the primary tool for cooperative governance within the sector. While the requirement for these plans is new for national and provincial governments, and for waste generators, this is not the case for local governments who had been able to voluntary prepare such plans within their Integrated Development Plans (IDPs). IWMPs are mandatory for national and provincial government and specified waste generators, but the situation for local government is made a little more ambiguous by the Constitutional assignment of concurrent powers to provincial and local governments in this respect, with only limited authority assigned to national government.

(j) **Norms, standards, tariffs and financial Management Systems**

Other focal areas of the Waste Act include provisions for the development of norms and standards, tariffs and financial management systems. These powers all largely repeat existing national or provincial powers that are provided for in other legislation. The key change is that the Minister of Environmental Affairs now assumes these powers in terms of the Act, although concurrently with other authorised Ministers notably in Local Government and Finance portfolios.

Certain sections of the act have yet to be enacted, including the following:

- Section 28 (7), which makes allowance for of a person, category of person or industry to compile and submit an industry waste management plan for approval to the MEC, without being required to do so by the MEC.

Section 46, which allows the licensing authority to require an applicant seeking a waste management licence to appoint an independent and qualified person to manage the application.

10.3.5 National Environmental Management: Air Quality Act

The National Environmental Management: Air Quality Act (39 of 2004) requires that appropriate consideration must be given to the emissions arising from waste management practices, processes and procedures. Many facets of waste management are associated with atmospheric emissions, for

example, waste transportation is associated with carbon dioxide released from vehicles, and methane and carbon dioxide which are released from landfill sites.

The Air Quality Act was published in the Government Gazette on 24 February 2005 and came into effect in September 2005. This Act, amongst others, provides for the implementation of a National Framework, of national, provincial and local ambient air quality and emission standards and air quality management plans. These implementations are currently in progress.

10.3.6 **Atmospheric Pollution Prevention Act**

Prior to the Air Quality Act coming into full effect, the control of atmospheric emissions of noxious, hazardous and nuisance causing materials was controlled by the Atmospheric Pollution Prevention Act (APPA) (Act 45 of 1965) and its amendments. The administration of the APPA has been assigned to the Air Pollution Control Department under the Department of Environmental Affairs & Tourism.

Those sections addressing the management of dust are of importance for landfill site management. Sections 27 – 35 state that industries should adopt the "best practicable means" for preventing dust from becoming dispersed or causing a nuisance. The act also empowers owners or occupiers present in the vicinity of the source of dust/nuisance to take or adopt necessary steps or precautions against the nuisance. Where steps have not been prescribed, owners must adopt the "best practicable means" for the abatement of the nuisance. Should any person/s such as for example, waste management service providers, not comply with the necessary steps to prevent owners/occupiers from the effects of dust, the person/s may be liable to pay a dust control levy to the minister.

10.3.7 **National Water Act**

The National Water Act (Act 36 of 1998) is South Africa's overarching piece of legislation dealing with water resource management. It contains a number of provisions that impact on waste management, including:

- Ensuring the disposal of waste in a manner, which does not detrimentally impact on water resources.
- Managing the discharge of waste into water resources.

The Act allows the Minister to make regulations for:

- Prescribing waste standards, which specify the quantity, quality and temperature of waste that may be discharged or deposited into or allowed to enter a water resource.
- Prescribe the outcome or effect, which must be achieved through management practices for the treatment of waste before it is discharged or deposited into or allowed to enter a water resource.

- Requiring that waste discharged or deposited into or allowed to enter a water resource be monitored and analysed according to prescribed mechanisms.

10.3.8 Occupational Health and Safety Act

The purpose of the Occupational Health and Safety Act (OHSA) (Act 85 of 1993)and associated regulations is to provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety; and to provide for matters connected therewith.

A sound waste management strategy and planning must take into account the safety of persons involved in the practical implementation thereof, with reference in particular to any waste services carried out by municipal officials; and waste service providers and their employees.

Core to OHSA are the principles and core duties of employers and employees as legislated in Sections 8, 9 and 14 thereof.

Section 8(1) stipulates that “Every employer shall provide and maintain, as far as is reasonable practicable, a working environment that is safe and without risk to the health of his employees”.

Section 9(1) stipulates that “Every employer shall conduct his undertaking in such a manner as to ensure, as far as is reasonably practicable, that persons other than those in his employment who may be directly affected by his activities are not thereby exposed to hazards to their health or safety.” Subsection (2) imposes a similar duty on every self-employed person.

Section 14(a) imposes a duty on every employee at work to take reasonable care for the health and safety of himself and of other person who may be affected by his acts or omissions. An employee is also required to co-operate with his employer concerning his duties in terms of the Act and to obey health and safety rules and procedures laid down by his employer.

In addition the OHSA further protects workers with regard to Hazardous Chemical Substances through specific regulations. Asbestos regulations deal with specific asbestos containing waste management.

It is likely that the OSHA also places an obligation on the Municipality, to ensure that service providers maintain compliant Health and Safety procedures. This would be relevant in the case of outsourced, waste management functions.

10.3.9 Health Act

The Health Act (Act 63 of 1977) focuses on the promotion of the health of the people and the provision of processes to enable this objective to be achieved. Sections 20, 34 and 38 of the Act are relevant to waste management.

Section 20, requires authorities to take lawful and reasonable practical measures to maintain their areas in a hygienic and clean condition to prevent an unhealthy environment for people.

Sections 34 and 38 of the act authorise the National Minister of Health to make regulations, which may directly impact on waste management.

10.3.10 Hazardous Substances Act

The Hazardous Substances Act (Act 15 of 1973) governs the control of substances that may cause ill health or death in humans by reason of their toxic, corrosive, irritant, flammability or pressure effects. The Act provides for the regulation of the storage, handling, labelling and sale of Group I, II, and III hazardous substances. A license is required for an operation that stores, handles and sells Group I substances. Section 29(1) of the Act regulates the disposal of the empty containers, which previously held Group I substances.

No national, local provincial or local municipal regulations have been promulgated under the Act for the on-site management of Group II hazardous substances.

The relevance of the Act with regard to waste management is captured as certain waste types may be categorised into the various groupings under the Act as noted above.

10.3.11 National Road Traffic Act

The United Nations (UN) recommendations on the transport of dangerous goods have been used to produce sections of the National Road Traffic Act (Act 93 of 1996). In addition, and in terms of other regulations published under the Act, certain South African Bureau of Standards (SABS) Codes of Practice have been incorporated as standard specifications into the National Road Traffic Regulations (GNR 1249 of 13 November 2001). These codes have been based on the UN recommendations, also known as “The Orange Book” and the associated European Agreement concerning the International Carriage of Dangerous Goods by Road Regulations.

The codes of practice so incorporated include e.g. the following:

- SANS 10228:2006 Edition 4.00: The identification and classification of dangerous goods for transport.
- SANS 10229-1:2005 Edition 1.00: Transport of dangerous goods - Packaging and large packaging for road and rail transport Part 1: Packaging.
- SANS 10229-2:2007 Edition 1.00: Transport of dangerous goods - Packaging and large packaging for road and rail transport Part 2: Large packaging.
- SANS 10232-1:2007 Edition 3.00: Transport of dangerous goods - Emergency information systems Part 1: Emergency information system for road transport.
- SANS 10232-2:1997 Edition 1.00: Transportation of dangerous goods - Emergency information systems Part 2: Emergency information system for rail transportation.
- SANS 10232-3:2007 Edition 3.00: Transport of dangerous goods - Emergency information systems Part 3: Emergency response guides.
- SANS 10232-4:2007 Edition 1.01: Transport of dangerous goods - Emergency information systems Part 4: Transport emergency card.
- SANS 10233:2001 Edition 2.00: Transportation of dangerous goods - Intermediate bulk containers.

The transportation of all waste products should adhere to the above where applicable, noting that certain waste/ refuse may be categorised as dangerous goods.

10.3.12 Advertising on Roads and Ribbon Development Act

The Advertising on Roads and Ribbon Development Act (Act 21 of 1940) regulates, amongst other things, the depositing or discarding of waste near certain public roads, and the access to certain land from such roads. To the extent as outlined in Proclamation 23 in Government Gazette 16340 of 31 March 1995, the administration of this Act has been assigned to the provinces. In terms of section 8 of the Act, no person shall within a distance of 200 metres of the centre line of a public road deposit or leave outside an urban area, so as to be visible from that road, a disused vehicle or machine or a disused part of a vehicle or machine or any rubbish or any other refuse, except in accordance with the permission in writing granted by the controlling authority concerned. The controlling authority may remove any object or substance referred to found on a public road and may recover the cost of the removal from the person who deposited or left such object or substance there.

When any person has deposited or has left any object or substance in contravention of the above, but not on a public road, the controlling authority concerned may direct the person in writing to remove or destroy that object or substance within such period as may be specified in the direction. If the person fails to comply with that direction, the controlling authority may cause the object or substance to be

removed or destroyed any may recover from the said person the cost of the removal or destruction. The preceding provision do not apply to any object or material which has been or is being used for or in connection with farming, or to soil excavated in the course of alluvial digging: provided that this sub-section shall not permit the deposit or leaving of any article or material on a road.

10.3.13 Waste Tyre Regulations

The Waste Tyre Regulations were first published as Government Notice R.149 on 13 February 2009 and came into effect on 30 June 2009. These regulations were amended in 2016 in General Notice R. 1493 of 2016. The latest Waste Tyre Regulations (R1064 of 2017) were published on 29 September 2017 and came into effect immediately. The purpose of the legislation is to regulate the management of waste tyres by providing for the regulatory mechanisms. The regulations apply uniformly in all provinces in South Africa and affect waste tyre producers, waste tyre dealers, waste tyre stockpile owners, landfill site owners and tyre recyclers.

In summary, the regulation:

- Defines a waste tyre as a new, used, re-treaded, or un-roadworthy tyre, not suitable to be re-treaded, repaired or sold as a part worn tyre and not fit for the original intended use.
- Prohibits management, recycling, recovery or disposal of a waste tyre at any facility or on any site, unless such an activity is authorised by law.
- Prohibits recovery or disposal of a waste tyre in a manner that may or may potentially cause pollution or harm to health.
- Prohibits purchase, sale or export of waste tyres unless authorised.
- Prohibits disposal of a waste tyre at a waste disposal facility, two years from the gazetted date, unless such a waste tyre has been cut into quarters; and prohibits disposal of tyres in five years; unless these are shredded.
- Provides regulations in terms of tyre producers, tyre dealers and tyre stockpile owners, particularly regarding waste stockpile abatement and waste tyre storage.

10.3.14 Asbestos Regulations

On 28 March 2008, the Minister of Environmental Affairs and Tourism published as Government Notice R.341 of 2008 entitled “Regulations for the prohibition of the use, manufacturing, import and export of asbestos and asbestos containing materials” under Section 24B of ECA (thus now the Waste Act). This would have implication for phasing out of asbestos containing material, which may therefore result in higher quantities of asbestos waste.

10.3.15 Mineral and Petroleum resources Development Act

The objective of the Mineral and Petroleum resources Development Act (No. 28 of 2002) , amongst others, is to give effect to section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development.

10.3.16 Municipal Structures Act

The main objective of Local Government: Municipal structures Act (Act 117 of 1998) is to provide for the establishment of municipalities in accordance with the requirements relating to categories and types of municipality, to provide for an appropriate division of functions and powers between categories of municipality, to provide appropriate electoral systems and to provide for matters connected therewith.

The functions and powers of municipalities are set out in Chapter 5 of the Act, with a municipality having the functions and power assigned to it in terms of sections 156 and 229 (dealing with fiscal powers and functions) of the constitution.

10.3.17 Municipal Systems Act

As intended by the Constitution, Waste management services such as refuse collection, removal, transportation and disposal is generally the responsibility of local municipalities6.

Municipal Systems Act (Act 32 of 2000) with respect to the Local Government Municipal Systems Act (MSA) defines a municipal service as follows:

"A serviced that a municipality in terms of its powers and functions provides or may provide for the benefit of the local community irrespective of whether

(a) Such a service is provided, or to be provided, by the municipality through an internal mechanism contemplated in section 76 or by engaging an external mechanism contemplate in section 76; and

(b) fees, charges or tariffs are levied in respect of such a service or not."

Chapter 8 Section 73 - 82 outlines certain general duties on municipalities in relation to the municipal service as highlighted below.

In terms of section 75(1), a municipality must give effect to the provisions of the Constitution and must:

- Give priority to the basic needs of the local community.
- Promote the development of the local community.

Ensure that all members of the local community have access to at least the minimum level of available resources and the improvement of standards of quality over time.

In terms of section 75(2), municipal services must – be equitable and accessible; be provided in a way, which promotes the prudent, efficient and effective use of available resources and the improvement of standards of quality over time; be financially sustainable; be environmentally sustainable, and be regularly reviewed with a view to upgrading, extension and improvement.

Section 74 regulates tariff policy in respect of municipal services. A municipality is obliged to adopt and implement a tariff policy on levying fees for municipal services. A municipality's tariff policy must reflect at least the following principles:

- People who use municipal services must be treated equitably in the application of tariffs.
- In general terms, what individual users pay for services should be in proportion to their use of the services.
- Poor households must have access to at least basic services. Different ways of providing for this are suggested, for example lifeline tariffs and subsidisation.
- Tariffs must reflect the costs reasonable associated with providing the service for example capital, operating, maintenance, administration and replacement costs and interest charges.
- Tariffs must be set at levels which allow the service to be financially sustainable.
- In appropriate circumstances, surcharges on tariffs may be allowed.
- Special tariffs may be set for categories of commercial and industrial users in order to promote local economic development.
- The economical, efficient and effective use of resources must be promoted, as well as the recycling of waste and other appropriate environmental objectives
- Any subsidisation of tariffs should be fully disclosed.

Section 78 prescribes the process which municipalities must follow when they decide through which mechanism to provide a municipal service in their areas. There are particular provisions,

which a municipality must comply with when it provides a municipal service through a service delivery agreement with what the MSA terms "external mechanisms".

The MSA contains extensive provisions pertaining to public participation. In particular, the community has the right to contribute to decision-making processes by its municipality. A municipal council must establish appropriate mechanisms, processes and procedures to enable residents, communities and stakeholders in the municipality to participate in the local affairs. It is pertinent to reiterate that waste management services as provide by the municipality is an integral part of local affairs.

As such municipalities' mechanisms must provide for:

- The receipt, processing and consideration of petitions and complaints lodged by residents, communities and stakeholders in the municipality.
- The receipt, processing and consideration of written objections and representations with regard to any matter to which it is required to invite public comment.
- Public meetings of residents, on a ward or any other basis.
- Public hearings by the council and its committees when appropriate.
- Surveys among residents when appropriate and the processing and publication of the results.

10.3.18 Development Facilitation Act

The Development Facilitation Act (Act 67 pf 1995) provides specific principles for:

- Land development and conflict resolution.
- Controls on land occupation.
- Recognition of informal land-development practices.

These principles are set out in sections 3 and 4 of the Development Facilitation Act and form the basis for most of the integrated development plan. Chapter one of the Development Facilitation Act sets out principles which affect all decisions relating to the development of land.

This means that whenever a municipality, a development tribunal, a Member of the Executive Council (MEC) or any other authority is considering an application for the development of land, they must make sure that their decision is consistent with these principles. Any integrated development plan must, in terms of the Local Government Transition Act, be based on these principles too.

The Development Facilitation Act's principles form the basis of integrated development planning - in particular the land-development objectives. In terms of section 2 of the Act, the general principles which are set out in section 3 of the Act include:

- Policy, administrative practice and the law should promote efficient and integrated land development in that they:
- Promote the integration of the social, economic, institutional and physical aspects of land development.
- Promote integrated land development in rural and urban areas in support of each other.
- Encourage environmental sustainable land development practices and processes.
- Members of communities affected by land development should actively participate in the process of land development.
- Policy, administrative practice and laws should encourage and optimize the contributions of all sectors of the economy (government and non-government) to land development so as to maximize the Republic's capacity to undertake land development.
- Laws, procedures and administrative practice relating to land development should:
- Be clear and generally available to those likely to be affected thereby.
- In addition to serving as regulatory measures, also provide guidance and information to those affected thereby.
- Be calculated to promote trust and acceptance on the part of those likely to be affected thereby.
- Give further content to the fundamental right set out in the constitution.
- Policy, administrative practice and laws should promote sustainable land development at the required scale, in that they should, inter alia, promote sustained protection of the environment.
- Policy, administrative practice and law should promote speedy land development.
- Each proposed land development area should be judged on its own merits and no particular use of land, such as residential, commercial, conservation, industrial, community facility, mining, agricultural or public use, should in advance or in general, be regarded as being less important or desirable than any other use of land.
- A competent authority at national, provincial and local government level should co-ordinate the interests of the various sectors involved in or affected by land development so as to minimize conflicting demands on scarce resources.

10.3.19 The Physical Planning Act

The objective of the Physical Planning Act 125 of 1991 is to provide for the division of the country into regions and to promote regional development. Policy plans consist of broad guidelines for the future

physical development of the area and restrictions are placed on the use of land in the area to which the plan relates. Local authorities are required to develop urban structure plans for their areas of jurisdiction.

10.3.20 Promotion of Administrative Justice

The purpose of the Promotion of Administrative Justice Act ("PAJA") (Act 3 of 2000) is principally to give effect to the right to administrative action that is lawful, reasonable and procedurally fair; and to the right to written reasons for administrative action as contemplated in section 33 of the Constitution; and to provide for matters incidental thereto.

Administrative law governs the relationships between public bodies, and between public and private bodies and/or individuals. Many activities which affect the environment, including certain waste management activities, require authorisation from a public body. Because environmental conflicts may arise during the authorisation process from the exercise of administrative decision-making powers, administrative law principles are of particular relevance to environmental law generally, and specifically in the context of the environmental authorisation requirements stipulated by the provisions of section 24 of the NEMA read with its subordinate legislation regulating environmental impact assessment (or "EIA").

10.3.21 Promotion of Access to Information

Promotion of Access to Information, (Act 2 of 2000) is closely linked to the notion of administrative justice is the right of access to information. Without access to information, a person may be unable to determine whether or not his or her right to just administrative action (or to an environment not harmful to human health or well-being or, for that matter, any other Constitutional right) has been infringed. The purpose of the Promotion of Access to Information Act ("PAIA") is to give effect to the Constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights, and to provide for matters connected therewith.

10.4 National Policies and Guidelines

10.4.1 White Paper on Environmental Waste Management

The White Paper on Environmental Management was published in 1998. This policy sets out government's objectives in relation to environmental management, how it intends to achieve its

objectives, and to guide government agencies and organs of state in developing strategies to meet their objectives.

The policy document is an overarching policy framework that refers to all government institutions and to all activities that impact on the environment. The policy states that government will allocate functions to the institutions and spheres of government that can most effectively achieve the objectives of sustainable development and integrated environmental management. This would include the allocation of certain functions to the municipal sphere of government. Where appropriate, provincial and local governments are to develop their own legislation and implementation strategies in order to address their specific needs and conditions within the framework of the policy.

10.4.2 White Paper on Integrated Pollution and Waste Management

The White Paper on Integrated Pollution and Waste Management (1999) is a subsidiary policy of the overarching environmental management and constitutes South Africa's first policy document focused on integrated waste management. This national policy set out Government's vision for integrated pollution and waste management in the country and applies to all government institutions and to society at large and to all activities that impact on pollution and waste management.

Integrated pollution and waste management is defined as a holistic and integrated system and process of management aimed at pollution prevention and minimisation at source, managing the impact of pollution and waste on the receiving environment and remediating damaged environments. Waste management is to be implemented in a holistic and integrated manner and extend over the entire waste cycle from cradle-to-grave and will include the generation, storage, collection, transportation, treatment and the final disposal of waste.

The overarching goal reflected in the policy, is integrated pollution and waste management. The intention is to move away from fragmented and uncoordinated pollution control and waste management, towards an approach that incorporates pollution and waste management as well as waste minimisation.

Within this framework, the following strategic goals apply:

- Effective institutional framework and legislation.
- Pollution and waste minimisation, impact management and remediation.
- Holistic and integrated planning – the intention is to develop mechanisms to ensure that integrated pollution and waste management considerations are integrated into the development of government

policies, strategies and programmes as well as all spatial and economic development planning processes and in all economic activity.

The strategic mechanisms include the following:

- The incorporation of integrated environmental management principles and methodologies in spatial development planning as it relates to pollution and waste management.
- Making timeous and appropriate provision for adequate waste disposal facilities.
- Developing management instruments and mechanisms for the integration of pollution and waste management concerns in development planning and land allocation.
- Developing appropriate and agreed indicators to measure performance for inclusion in Environmental Implementation Plans and Environmental Management Plans as provided for in the National Environmental Management Act.
- Participation and partnerships in integrated pollution and waste management governance.
- Empowerment and education in integrated pollution and waste management.
- Information management.
- International co-operation.

10.4.3 National Waste Management Strategy

The first NWMS was published in 1999 by the then DEAT and the then DWAF. It was the first strategy for addressing South Africa's waste management challenges. The strategy effectively defines South Africa's vision for waste management highlighting themes such as "cradle to grave" management of waste products and the waste management hierarchy which encourages waste disposal only as a last resort.

The NWMS has recently (2011) been revised in line with Chapter 2, Part 1, of the Act which requires the establishment of a NWMS within two years of the Act coming into effect. Significant changes include the addition of "remediation" to the waste management hierarchy, and the consolidation of what was previously many different action plans into a single action plan.

The new strategy defines eight strategic goals with a number of targets, as presented in the table below.

Table 50: Goals and targets of the NWMS (2011)

Goal	Description	Targets 2016
Goal 1	Promote waste minimisation, re-use, recycling and recovery	• 25% of recyclables diverted from landfill sites for re-use, recycling or recovery. • All metropolitan municipalities, secondary cities and large

Goal	Description	Targets 2016
	of waste.	towns have initiated separation at source programmes. • Achievement of waste reduction and recycling targets set in Industry IWMPs for paper and packaging, pesticides, lighting (CFLs) and tyre industries
Goal 2	Ensure the effective and efficient delivery of waste services.	• 95% of urban households and 75% of rural households have access to adequate levels of waste collection services. • 80% of waste disposal sites have permits.
Goal 3	Grow the contribution of the waste sector to the green economy.	• 69 000 new jobs created in the waste sector • 2 600 additional SMEs and cooperatives participating in waste service delivery and recycling
Goal 4	Ensure that people are aware of the impact of waste on their health, well-being and the environment.	• 80% of municipalities running local awareness campaigns. • 80% of schools implementing waste awareness programmes.
Goal 5	Achieve integrated waste management planning.	• All municipalities have integrated their IWMPs with their IDPs, and have met the targets set in IWMPs. • All waste management facilities required to report to SAWIC have waste quantification systems that report information to WIS.
Goal 6	Ensure sound budgeting and financial management for waste services.	• All municipalities that provide waste services have conducted full-cost accounting for waste services and have implemented cost reflective tariffs.
Goal 7	Provide measures to remediate contaminated land.	• Assessment complete for 80% of sites reported to the contaminated land register. • Remediation plans approved for 50% of confirmed contaminated sites.
Goal 8	Establish effective compliance with and enforcement of the Waste Act.	• 50% increase in the number of successful enforcement actions against non-compliant activities. • 800 EMIs appointed in the three spheres of government to enforce the Waste Act.

The overall objective of this strategy is to reduce the generation of waste and the environmental impact of all forms of waste and thereby ensure that the socioeconomic development of South Africa, the health of the people and the quality of its environmental resources are no longer adversely affected by uncontrolled and uncoordinated waste management.

The internationally accepted waste hierarchical approach was adopted of waste prevention/minimization, recycle/reuse, treatment and finally disposal. The strategy outlines the functions and responsibilities of the three levels of government and where possible, firm plans and targets are specified.

Action plans have been developed for reaching all of the eight goals.

10.4.4 Polokwane Waste Summit Declaration

During September 2001 a national waste summit was held at Polokwane, in the Northern Province. It was attended by key stakeholder groupings in the waste field in order to jointly chart a way forward in terms of national waste management. The resultant Polokwane Declaration includes a vision and goal for the management of all waste, i.e. domestic, commercial and industrial:

Vision – To implement a waste management system that contributes to sustainable development and a measurable improvement in the quality of life, by harnessing the energy and commitment of all South Africans for the effective reduction of waste.

Goals - To reduce waste generation and disposal by 50% and 25% respectively by 92012 and develop a plan for zero waste by 2022

Key actions in the Polokwane Declaration include the following:

- Implement the National Waste Management Strategy.
- Develop and implement legislative and regulatory framework.
- Waste reduction and recycling.
- Develop waste information and monitoring systems.

10.4.5 Local Government Turnaround Strategy

Cabinet approved the Local Government Turnaround Strategy (LGTAS) on the 3 December 2009 in Pretoria. The LGTAS recognised that each municipality faces different social and economic conditions and has different performance levels and support needs. Thus a more segmented and differentiated approach was required to address the various challenges of municipalities. In addition cabinet recognised that the problems in Local Government are both a result of internal factors within the direct control of municipalities as well as external factors over which municipalities do not have much control. (Department of Cooperative Governance and Traditional Affairs, Dec 2009.)

The LGTAS identifies the internal factors related to for example the following:

- Quality of decision-making by Councillors.
- Quality of appointments.

- Transparency of tender and procurement systems and levels of financial management and accountability.
- Levels of financial management and accountability.

The external factors relate to:

- Revenue base and income generation potential.
- Inappropriate legislation and regulation.
- Demographic patterns and trends.
- Macro and micro-economic conditions.
- Undue interference by political parties and weaknesses in national policy.
- Oversight and Inter-Governmental Relations.

Ultimately the aim of the LGTAS is to:

- Restore the confidence of the majority of our people in our municipalities, as the primary delivery machine of the developmental state at a local level.
- Re-build and improve the basic requirements for a functional, responsive, accountable, effective, and efficient developmental local government.

The LGTAS sets out five strategic objectives with associated key interventions. Probably most relevant in the context of waste management is the first objective, i.e. to *"Ensure that municipalities meet basic needs of communities. This implies that an environment is created, support provided and systems built to accelerate quality service delivery within the context of each municipality's conditions and needs".*

Interventions to achieve the various objectives include better organisation by National Government and improved support and oversight from provinces in relation to Local Government. Furthermore municipalities are to reflect on their own performance and tailor-made turnaround strategies, while all three spheres of governments should improve inter-governmental relations. Also, political parties are to promote and enhance institutional integrity of municipalities and a social compact on Local Government where all citizens are guided in their actions and involvement by a common set of governance values.

In terms of the LGTAS an immediate task is for agreements to be reached with each province on the roll-out programme to establish different provincial needs and capacities, which will guide how

municipalities are to be supported to prepare and implement their own tailor-made turnaround strategies that must be incorporated into their IDPs and budgets (by March 2010). Key stakeholders and ward committees were to be mobilised early in 2010. By July 2010, all municipalities were to be in full implementation mode of the national and their own Turn-around Strategies. (Department of Cooperative Governance and Traditional Affairs, Dec 2009.)

10.4.6 Draft Municipal Sector Plan

The first Draft Municipal Sector plan was published for public comment on 6 April 2011 by the Minister of Environmental Affairs (notice 182 of Government Gazette 34167 dated 30 March 2011).

The draft plan is based on the findings of a study commissioned in 2007 and is informed by the local government turnaround strategy of 2009, which seeks to address the root causes of poor performance and dysfunctionality at municipal level. The draft plan forms an appendix to a report on the municipal waste sector and seeks to "effectively" address the management of "backlogs" in municipal solid waste service delivery and infrastructure.

An introduction to the report states that, in an attempt to fast track service delivery, cabinet directed all sector departments to account for service backlogs and develop service plans to address them. The draft plan identifies short-, medium- and longer-term objectives over a period of fifteen years and includes strategies for:

- Collecting recyclable waste (both by way of kerbside collection and at drop-off facilities).
- Composting.
- Energy recovery.
- Reducing waste-to-landfill.
- Cleaner production principles for industry.
- Alternative technologies for "different waste streams."
- Establishing cooperatives to formalise picking at landfills as a livelihood.

According to the report and related draft plan, it is envisaged that municipal waste management should be closely aligned with National Environmental Management: Waste Act 59 of 2008.

With regard to municipalities this act affects:

- Standards for removing, storing and disposing of waste (including separation, compacting and

treatment).

- Litter control.

Related institutional and planning arrangements as informed by:

- Municipal Structures Act 117 of 1998.
- Municipal Systems Act 32 of 2000.

10.4.7 Minimum Requirements Documents; Department of Water Affairs and Forestry

The DWAF Minimum Requirements: Waste Management Series were formulated in the form of guideline documents as a joint venture between DWAF and the Department of Environmental Affairs and Tourism (DEAT).

The objective of the Minimum Requirements is to establish a framework for standards for waste management in South Africa. The former DWAF published the second edition of the Minimum Requirements series in 1998, consisting of the following three documents:

- Document 1: Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste.
- Document 2: Minimum Requirements for Waste Disposal by Landfill.
- Document 3: Minimum Requirements for Monitoring at Waste Management Facilities.

The third edition was released in draft form in 2005, but only Document 1 (DEAT, 2005) has been finalised.

The Minimum Requirements provide applicable waste management standards or specifications that should be met, as well as providing a point of departure against which environmentally acceptable waste disposal practices can be assessed. The objectives of setting Minimum Requirements are to:

- Prevent water pollution and to ensure sustained fitness for use of South Africa's water resources.
- Attain and maintain minimum waste management standards in order to protect human health and the environment form the possible harmful effects caused by the handling, treatment, storage and disposal of waste.
- Effectively administer and provide a systematic and nationally uniform approach to the waste disposal process.
- Endeavour to make South African waste management practices internationally acceptable.

- Ensure adherence to the Minimum Requirement conditions from the permit applicant, before a waste disposal site permit is issued.
- Promote the hierarchical approach to waste management, as well as a holistic approach to the environment.

The series formed the basis for the permitting process that had been required in terms of Section 20 of the ECA. The requirements, standards and procedures covered in the series had generally been included as permit conditions, thereby becoming legally binding on the permit holder. In addition to requirements for the establishment and operation of a landfill site, the permit holder was generally required to operate, maintain and attend to the closure of a waste disposal site in compliance with the permit conditions, as well as in accordance with the guidelines set out in the Minimum Requirements documents. Note that an EIA must be conducted prior to the establishment of waste disposal facilities. However, the above mentioned waste activity has now been repealed and instead requires a license application under the Waste Act.

The third edition was released in draft form in 2005, but only Document 1 (DEAT, 2005) has been finalised.

10.4.8 National Policy for Basic Refuse Removal Services to Indigent Households

The National Policy for the Provision of Basic Refuse Removal Services to Indigent Households (GN No. 34385) was published in the Government Gazette in June 2011.

The purpose of this policy is to ensure that indigent households have access to at least a basic refuse removal (BRR) service.

This Policy aligns to existing relevant legislation, as in accordance to 74 (2)(c) of the Municipal Systems Act, 2000 (Act No. 32 of 2000) poor households must have access to at least basic services and section 9 (2) of NEMWA (Act 59 of 2008) which stipulates that each municipality must exercise its executive authority and perform its duty in relation to waste services, including waste collection, waste storage and waste disposal, by (c) ensuring access for all to such services.

The objectives of the policy are to identify households that can be enrolled for the BRR service, establish bylaws to enforce tariff policies that will support the BRR service and to raise awareness within the

municipality with regard to correct handling of domestic waste for BRR and the need to minimize waste and recycle.

Implementation plans include each municipality:

- declaring specific localities as the recipients of basic refuse removal services;
- maintaining “accurate and updated” registers of indigent people;
- taking action in the event of malpractice;
- integrating basic refuse removal into “basic indigent policies”;
- designating the administration of the policy to the “most appropriate department”; and
- raising awareness.

The policy includes a “grid of responsibilities” for each sphere of government and a policy monitoring and evaluation plan. According to the grid of responsibilities, national government will take responsibility for building capacity at provincial and municipal level, with provincial government determining municipal capacity and assisting district municipalities in “drawing up guidelines”.

10.4.9 National Policy in Thermal Treatment of General and Hazardous Waste

The Thermal Waste Treatment of General and Hazardous Waste Policy was gazetted (GN No. 32439) for public comment on 30 January 2009 and published under the Waste Act on 24 July 2009. The policy presents the Government’s position on thermal waste treatment as an acceptable waste management option in South Africa. It also provides the framework within which incineration and co-processing treatment technologies of general and hazardous waste should be implemented in the country.

All Government Departments across the different spheres of government must consider this policy in their decision making on matters pertaining to thermal treatment of waste.

The policy presents objectives which vary thematically. These consider the integration of thermal waste treatment into the integrated waste management system. Schedules one to four provide guidelines on the following:

(k) **Air Emission Standards – Waste Incineration**

Listed air emission standards for general and hazardous waste incinerators, brought into operation subsequent to the final gazetting of this policy, to be complied with until the formalisation of The

Minimum Emission Standards in terms of Section 21 of the National Environmental Management: Air Quality Act of 2004.

(l) **Air Emission Standards – AFR Co-Processing**

The Minimum Emission Standards for Alternative Fuels and Raw Materials (AFR) co-processing is currently in the process of being formalised in terms of Section 21 of the National Environmental Management: Air Quality Act of 2004. In the interim this policy constitutes the air emission standards for all cement kilns co-processing AFR.

(m) **Waste Excluded from Co-Processing**

Listed types of waste that are not allowed to be received, stored, handled or co-processed in cement kilns.

(n) **Conditions of Environmental Authorisation**

Any cement plant co-processing general or hazardous waste as alternative fuels and/or raw materials, and any dedicated general and/or hazardous waste incinerator must have the relevant approvals from the competent authority. This schedule includes notes on operational management, air quality management, waste management and monitoring and reporting.

10.4.10 National Waste Information Regulations

The National Waste Information Regulations came into effect on 01 January 2013.

These cover registration of persons who conduct certain waste management activities and their duty to keep records. Annexure 1 of the regulations lists activities including recovery and recycling, treatment and disposal of waste for which the person conducting the activity must register in terms of GR 625 of 2012. The municipality has a duty in terms of waste disposal to land (as well as operating waste recycling or treatment facilities) to report waste types and quantities in accordance with these regulations to SAWIC on a quarterly basis.

10.4.11 National Policy for the provision of basic refuse removal services to indigent households

The National Policy for the provision of basic refuse removal services to indigent households as published for general information in notice 413 of Government Gazette No. 34385 on 22 June 2011

was developed in response to the constitutional requirement that all households should have access to basic services regardless of their income level, as well as the adoption of a free basic services in 2001.

This Policy aligns to existing relevant legislation, as in accordance to 74 (2)(c) of the Municipal Systems Act, 2000 (Act No. 32 of 2000) poor households must have access to at least basic services and section 9 (2) of NEMWA (Act 59 of 2008) which stipulates that each municipality must exercise its executive authority and perform its duty in relation to waste services, including waste collection, waste storage and waste disposal, by (c) ensuring access for all to such services.

Implementation plans include each municipality:

- Declaring specific localities as the recipients of basic refuse removal services.
- Maintaining "accurate and updated" registers of indigent people taking action in the event of malpractice.
- Integrating basic refuse removal into "basic indigent policies."
- Designating the administration of the policy to the "most appropriate department."
- Raising awareness.

The policy includes:

- A "grid of responsibilities" for each sphere of government.
- A policy monitoring and evaluation plan.

According to the grid of responsibilities, national government will take responsibility for building capacity at provincial and municipal level, with provincial government determining municipal capacity and assisting district municipalities in "drawing up guidelines".

10.4.12 National Domestic Waste Collection Standards

The National Domestic Waste Collection Standards (notice 21 of Government Gazette 33935, 21 January 2011) published under the National Environmental Management: Waste Act (Act No. 59 of 2008) came into effect on Tuesday, 1 February 2011.

This standard aims to provide a uniform framework within which domestic waste should be collected in South Africa. This comes after a consultative process with provinces, municipalities and the general

public in order to redresses the past imbalances in the provision of waste collection services. The standards aim to guide municipalities on how to provide acceptable, affordable and sustainable waste collection service to the human health and the environment.

The standards covers the levels of service, separation at source (between recyclable and non-recyclable materials), collection vehicles, receptacles, collection of waste in communal collection points, and most importantly the frequency of collection. Non-recyclable material such as perishable food waste must be collected at least once a week and recyclable material such as paper, plastic, glass etc. must be collected once every two weeks. Municipalities have a choice to provide different types of bins taking into consideration the type of vehicles they use; however, they must be rigid and durable to prevent spillage and leakage.

The development of the standards took into consideration the existing innovative practices at local government level across the country and seeks to build on what has already been achieved whilst emphasizing a need to separate recyclable and non-recyclable domestic waste and the protection of human health and the environment.

10.4.13 National Norms and Standards for Assessment of Waste for Landfill Disposal

The National Norms and Standards for Assessment of Waste for Landfill Disposal (GR635, 23 Aug 2013) require the assessment of waste prior to disposal at landfill. The assessment of waste before disposal must include identification of the total and leachable concentrations of different chemicals. The concentration of chemicals determines the classification of the waste which in turn dictates the type of disposal site where the waste can be disposed of.

10.4.14 Waste Classification and Management Regulations

The Waste Classification and Management Regulation (GR635, 23 Aug 2013) aims to address the management of different waste categories. The regulations stipulate the requirements for the transport storage and treatment of different waste types. A list of requirements for record keeping by waste generators is also included in the regulations with the aim of improving and standardising record keeping. The regulations also detail the process to be followed when motivating why a listed waste management activity does not require a waste management license.

10.4.15 National Norms and Standards for Disposal of Waste to Landfill

The National Norms and Standards for Disposal of Waste to Landfill (GR636, 23 Aug 2013) specify minimum engineering design requirements for landfill sites. The design requirements vary depending on the type of waste to be disposed of at the site.

Landfill sites are designed to comply with one of four designs (Class A – Class D). The landfill design classes vary in the types of liner used. Class A landfill sites require multiple linings and leachate collection systems whereas a Class D landfill site is much simpler in design requiring only a 150 mm base preparation layer. Different classes of landfill are required for different types of waste.

10.4.16 National Norms and Standards for the Storage of Waste

The National Norms and Standards for the Storage of Waste (GN 926, Nov 2013) specify the minimum requirements for waste storage facilities in the interest of protection of public health and the environment. The standards aim to ensure that waste storage facilities are managed according to best practise and to provide a minimum standard for the design and operation of new and existing waste storage facilities.

Hazardous waste storage facilities should be located in areas zoned as industrial, where waste storage facilities are located in residential areas a buffer of at least 100 m must be assigned to the site. General waste storage facilities must be located in an area that is easily accessible by the public.

The standards also specify design requirements for waste storage facilities, these include:

- Access roads
- Signage at the entrance of the facility in at least three official languages applicable to the areas the facility is located in. The sign must indicate:
    - The risk associated with entering the site.
    - Hour of operation.
    - Name, address and telephone number of the person responsible for the operation of the facility.

The standards also require that waste is separated at source into recyclables and non-recyclables.

A new condition for the management of waste storage facilities is the requirement for bi-annual internal audits and biennial external audits

10.4.17 National standards for the extraction, flaring or recovery of landfill gas

The National standards for the extraction, flaring or recovery of landfill gas (GN 924 of 2013) aims to control the extraction, flaring and recovery of gas at landfills or recovery facilities to minimise harmful impacts to people and the surrounding environment. The standards require, in planning phase, that an assessment of environmental risks and impacts that are associated with the proposed activities is complied, and that Environmental Management Plan is compiled to mitigate these risks. The standard contains a set of standard procedures for handling and maintaining of equipment for construction, operational and decommissioning phase. The standard also covers training, emergency response, monitoring and reporting, general requirements and transitional arrangements.

10.4.18 National standards for scrapping or recovery of motor vehicles

The National standards for scrapping or recovery of motor vehicles (GN 925 of 2013) puts forth minimum requirements for the design, construction and upgrading of a motor scrapping facility. The design must consider: sensitive environments; drainage systems; storage and operational areas for off-loading, dismantling, liquid waste, shredding, dispatching parts and recyclables. Specific design requirements are set out for different operational areas. Minimum requirements are given for the operational phase including vehicle dismantling, solid waste management, and liquid waste management. Minimum requirements in the decommissioning phase focus on the compilation of a rehabilitation plan for the facility and disposal of contaminated wastes. The standard also covers training, emergency response, monitoring and reporting, general requirements and transitional arrangements.

10.4.19 National norms and standards for sorting, shredding, grinding, crushing, screening of waste

The National norms and standards for sorting, shredding, grinding, crushing, screening of waste (GN 1093 of 2017) require all waste facilities (used for sorting, shredding, grinding, crushing, screening of waste) less than 100m2 in size to register with the competent authority and provide details including the location, types of waste processed, and civil design drawings of the facility as set out in Section 4 of the standard.

The standards require all waste facilities (used for sorting, shredding, grinding, crushing, screening of waste) more than 100m2 in size register with the competent authority as set out in Section 4 of the standard, as well as comply with requirements for the location, design, construction, access control and signage. Operational requirements in Section 8 of the standard address management of operational impacts such as control of hazardous substances, air emissions, discharging of wastewater, noise and

odour emissions. The standard also covers training, emergency response, monitoring and reporting, general requirements, requirements during the decommissioning phase and transitional provisions.

10.5 Local Strategy and Policies

10.5.1 Mandeni Local Municipality Integrated Development Plan

The MLM's present Integrated Development Plan (IDP) covers the period 2017 – 2022. It has been finalised and represents the first IDP for the amalgamated municipality. It notes a commitment to providing quality and sustainable waste management services to the residents of MLM, and includes waste management targets and projects. These have been considered in the 'Needs Analysis' section of the report.

10.5.2 Municipal By-laws

Chapter 7 of the South African constitution: Section 156 provides that a municipality may make and administer by-laws for the effective administration of matters which it has the right to administer and that (section 151) it shall not be in conflict with national or provincial legislation.

This is further supported in the municipal systems act (Act 32 of 2000), Chapter 3: section 11 for a municipality to exercise executive authority within its boundaries to implement applicable by-laws. Section 75 of the MSA provides for the municipal council to adopt by-laws to give affect and enforce its tariff policy.

The Draft Municipal Sector Plan (Notice 182 of Government Gazette 34167) was published by the Minister for public comment on the 30 March 2011. Section 3.3.9.5 motivates that the enforcement of municipal waste by-laws is required to address ineffective collection systems through the enforcement of available resource-based controls which will improve the situation at community level. 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 (Act107 of 1998).

(b) Mandeni Local Municipality By-Laws

There are gazetted by-laws for waste management for MLM. By-laws have been drafted and were gazetted in 2015. During the IWMP draft workshop it was suggested that the by-laws are revised. The by-laws contain a schedule of fines for illegal dumping and illegal waste management practices.

Appendix B

Recording of Waste Disposal Tonnages Requirements

Recording of Waste Disposal Tonnages

Recording the tonnages of waste disposed to landfill is an important part of managing waste. This can be achieved using a weighbridge or through manual recordings. This information is also required for reporting on the South African Waste Information System (SAWIS). The following summary of these two options for recording waste disposal tonnages has been taken as an extract from the DEA's IWMP toolkit (accessed on 08.01.2018).

Option 1: Weighbridge

The weighbridge method involves recording the amount of waste at the point of entry to a landfill and again on the way out. The difference in the mass of the vehicle between the 'in' and 'out' provides the mass of the waste. A weighbridge operator is required to correctly identify the types of waste disposed of. The data is captured using weighbridge software that can simultaneously provide billing information based on the type of waste and the size of the vehicle.

Option 2: Without a weighbridge: Making use of the vehicle capacity and the waste densities template (a volume density estimation system).

In instances where a municipality does not have a weighbridge, it can make use of templates that were developed by DEA. These provide guidance on how waste quantities can be estimated for the different waste streams. The first template provides a list of typical vehicles used to dispose of waste in waste disposal facilities. This template makes use of estimations (by mass) that have been made based on the size of the vehicles measured in cubic meters. The second template contains possible pre-calculated and estimated density values which are based on the type of vehicle carrying a particular pre-classified waste type.

This waste mass estimation system uses the below formula that requires waste volume, waste density and waste loading to determine the mass entering a waste disposal facility:

Formula: waste mass (kg) =vehicle volume (m3) x load/s x waste density (kg/ m3).

On a monthly basis a municipality must compile a summary of the quantities of waste received and should submit this information to the South Africa Waste Information Centre (SAWIC). DEA has developed data capture forms which comprise of a landfill monthly data capture form as well as a landfill annual data summary form. Using the daily waste data collection form, municipalities are required to

enter the information from the daily data capture form into a monthly data form in order to transfer the handwritten data into a spreadsheet.

Appendix C

IWMP Draft Workshop Comments and Response Report – 12 September 2019

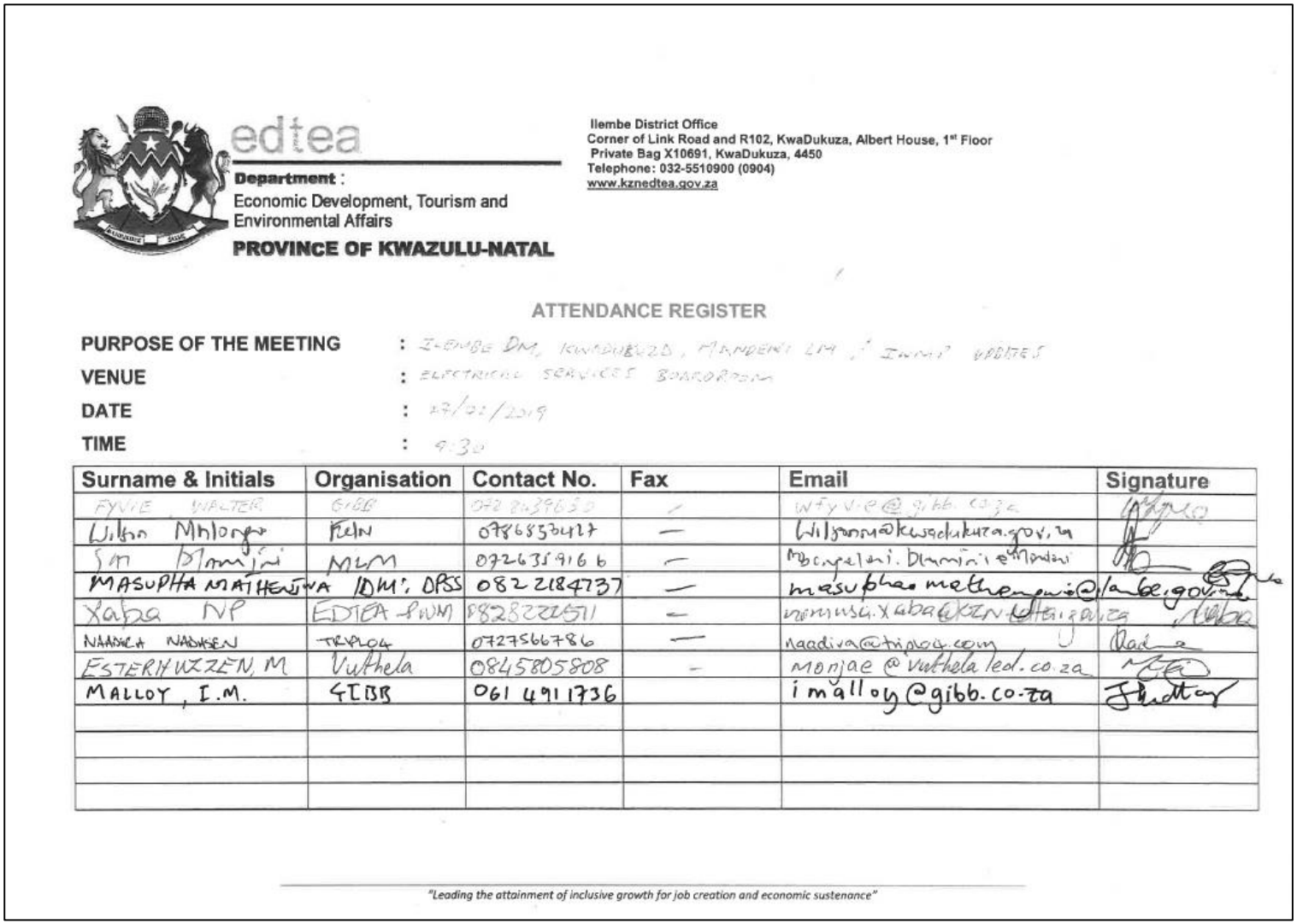
The comments received and raised during the IWMP draft workshop as well as a response to these comments are presented in the table below.

No.	Comments	Response
1	**Nomusa Xaba:** The IWMP should touch on the design of transfer stations, drop off centres and MRFs.	**GIBB:** The IWMP includes information on waste infrastructure and the need for development of further waste infrastructure was included as a target of the implementation plan. The proposed waste masterplan will take this issue further and should consider concepts for transfer stations, drop off facilities, composting facilities, MRFs etc.
2	**Director of Community Services:** The EDTEA should assist the MLM with the waste tonnages issue on SAWIS. The MLM is concerned with double capturing waste tonnage data on SAWIS as the King Cetshwayo district municipality will capture waste disposal data and the MLM. The EDTEA should assist the MLM to develop a system for capturing information for waste diversion.	**Nomusa Xaba:** It was the responsibility of the organisation accepting and disposing the waste to the landfill to report this waste tonnage on SAWIS on behalf of the municipality. The municipality should ensure that there is way to verify the waste disposal tonnages. Waste separation is undertaken at the King Cetshwayo landfill site therefore the tonnage of waste transported to the landfill is not the amount of waste going into the landfill.
3	**Nomusa Xaba:** The EDTEA can assist the MLM with sourcing funding for various waste infrastructure and management projects. The MLM should commence with plans and approach the department. Without a plan the department cannot assist.	-
4	**Munya Mutyora:** The regional landfill site should form part of the planning for the LMs with regards to waste management infrastructure.	
5	**Munya Mutyora:** What is the facility where recyclable waste is exchanged for money or goods?	Generally called a swop shop. Money is not always used, sometimes food or used donated goods are used for exchange of recyclables.
6	**GIBB**: Target project for the MLM is to update the register of people residing on tribal land.	**Munya Mutyora**: Vuthela LED department is updating the indigent register of the iLembe District. This will assist the MLM and the MLM can use the results of this study. The MLM to request information from MLM representative for this project.

7	**Director of Community Services:** GIBB to present the IWMP draft to the Portfolio committee.	**Munya:** The Vuthela LED programme to provide feedback to the MLM Community Services Director regarding her request. This is also based on the availability of the PSC and how often the Portfolio committee meets.

Appendix D

Attendance Registers for the IWMP presentations, progress meeting and workshops



edtea

Department :
Economic Development, Tourism and Environmental Affairs
PROVINCE OF KWAZULU-NATAL

Ilembe District Office
Corner of Link Road and R102, KwaDukuza, Albert House, 1st Floor
Private Bag X10691, KwaDukuza, 4450
Telephone: 032-5510900 (0904)
www.kznedtea.gov.za

ATTENDANCE REGISTER

PURPOSE OF THE MEETING : ILEMBE DM, KWADUKUZA, MANDENI LM & INNIS UPDATES
VENUE : ELECTRICAL SERVICES BOARDROOM
DATE : 27/02/2019
TIME : 9:30

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MALLOY, I.M.	GIBB	061 491 1736		imalloy@gibb.co.za	

"Leading the attainment of inclusive growth for job creation and economic sustenance"

Figure 19: Attendance register for the KwaDukuza, Mandeni and iLembe Municipalities IWMP Progress Meeting held on 27 February 2019

ILEMBE DISTRICT, KWADUKUZA LOCAL AND MANDENI LOCAL MUNICIPALITIES IWMP PROGRESS MEETING

ATTENDANCE REGISTER

GIBB ENGINEERING & ARCHITECTURE

CLIENT: Vuthela Ilembe LED Programme
PROJECT: Ilembe DM, KwaDukuza LM and Mandeni LM IWMPs Updates
PROJECT No: GE38104
PURPOSE: Progress Meeting
VENUE: Lavoipierre Building, 2 Industria Crescent, KwaDukuza
DATE & TIME: 22 May 2019, 10:00 - 13:00

REPRESENTATIVE		COMPANY / ORGANISATION NAME	OFFICE NR.	CELL PHONE NR.	OFFICE FAX NR.	E-MAIL ADDRESS	PREFERRED METHOD OF DISTRIBUTION		
INITIALS & SURNAME	SIGNATURE						E-mail	Fax	BY HAND
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MASUPHA MATHENJWA		ILEMBE	03243794[illegible]	082218 (415) 4737	—	masupha.mathenjwa@ilembe.gov.za	✓		
Linda Mncube		ilembe	0304519475		—	linda.mncube@ilembe.gov.za			

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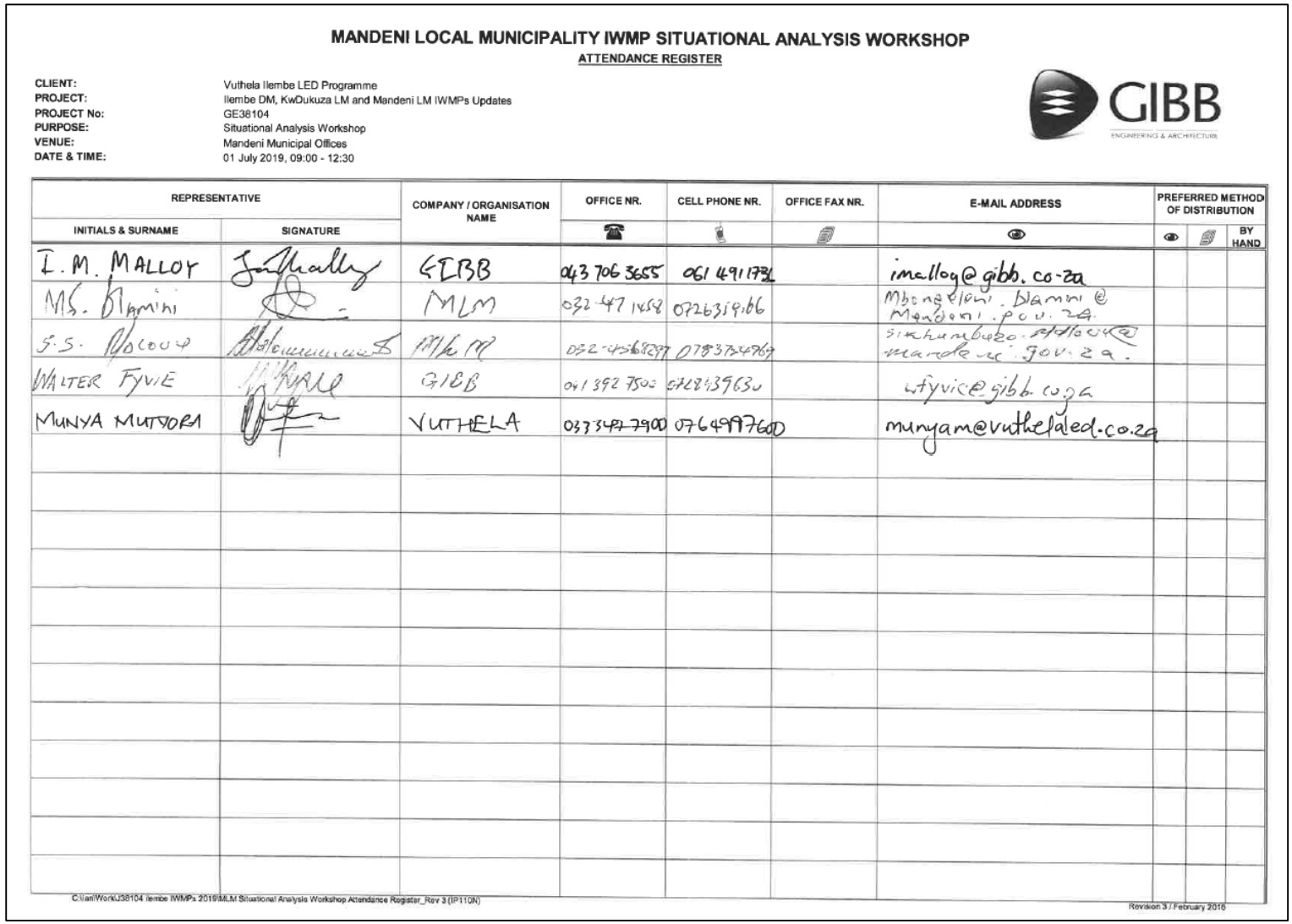
Revision 3 / February 2016

Figure 20: Attendance register for the KwaDukuza, Mandeni and iLembe Municipalities IWMP Progress Meeting held on 22 May 2019



MANDENI LOCAL MUNICIPALITY IWMP SITUATIONAL ANALYSIS WORKSHOP

ATTENDANCE REGISTER

GIBB ENGINEERING & ARCHITECTURE

CLIENT:	Vuthela Ilembe LED Programme
PROJECT:	Ilembe DM, KwDukuza LM and Mandeni LM IWMPs Updates
PROJECT No:	GE38104
PURPOSE:	Situational Analysis Workshop
VENUE:	Mandeni Municipal Offices
DATE & TIME:	01 July 2019, 09:00 - 12:30

REPRESENTATIVE		COMPANY / ORGANISATION NAME	OFFICE NR.	CELL PHONE NR.	OFFICE FAX NR.	E-MAIL ADDRESS	PREFERRED METHOD OF DISTRIBUTION		
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S.S. Mdlovu		MLM	032-4571297	0783734967		sikhumbuzo.mdlovu@mandeni.gov.za			
WALTER FYVIE		GIBB	041 392 7503	0728139630		wfyvie@gibb.co.za			
MUNYA MUTYORA		VUTHELA	0373497900	0764997600		munyam@vuthelaled.co.za			

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Revision 3 / February 2016

Figure 21: Attendance register for the Mandeni Local Municipality Situational Analysis and Gap and Needs Assessment Workshop

MANDENI LOCAL MUNICIPALITY IWMP DRAFT WORKSHOP

ATTENDANCE REGISTER

GIBB

ENGINEERING & ARCHITECTURE

CLIENT: Vuthela Ilembe LED Programme
PROJECT: Ilembe DM, KwDukuza LM and Mandeni LM IWMPs Updates
PROJECT No: GE38104
PURPOSE: Mandeni LM Draft IWMP Workshop
VENUE: Mandeni Municipal Offices, Mandini
DATE & TIME: 12 September 2019, 13:30 - 16:30

REPRESENTATIVE: INITIALS & SURNAME	REPRESENTATIVE: SIGNATURE	COMPANY / ORGANISATION NAME	OFFICE NR.	CELL PHONE NR.	OFFICE FAX NR.	E-MAIL ADDRESS	PREFERRED METHOD OF DISTRIBUTION: E-MAIL	PREFERRED METHOD OF DISTRIBUTION: FAX	PREFERRED METHOD OF DISTRIBUTION: BY HAND
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M.S. Mutyora	[illegible]	VUTHELA	0764997600		—	munyam@vuthelaled.co.za	✓		
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Revision 3 / February 2016

Figure 22: Attendance register for the Mandeni Local Municipality IWMP Draft Workshop

DOCUMENT CONTROL

FORM IP180_B

CLIENT	:	UWP Consulting
PROJECT NAME	:	Mandeni Local Municipality IWMP: Final Draft **PROJECT No. :** GE38104
TITLE OF DOCUMENT	:	**Mandeni Local Municipality IWMP - Final Draft.docx**
ELECTRONIC LOCATION	:	\\eastlondon-5\projects\J38104_Ilembe IWMPs 2018\03_Project Management Plan Design\G_Document Management - Reports\Outgoing\Mandeni LM\IWMP Final Draft\Mandeni Local Municipality IWMP - Final Draft.docx

	Approved By	Reviewed By	Prepared By
REVISION 1	NAME **Walter Fyvie**	NAME **Kate Flood and Walter Fyvie**	NAME **Ian Malloy**
DATE **29 September 2019**	SIGNATURE	SIGNATURE	SIGNATURE

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