

Makana Local Municipality Integrated Waste Management Plan (IWMP)



Draft Report

2024

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	DOCUMENT TITLE:	Draft IWMP	
	DOC NO:	MC.DFFE.IWMPs.2024	


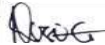



PROJECT INFORMATION

TITLE	Development of Integrated Waste Management Plans (IWMP) for Makana Local Municipality
SUBMISSION DATE	07 November 2024
OUR REFERENCE	MC.DFFE.IWMP.2024

VERSION AND AMENDMENT SCHEDULE

VERSION	VERSION DATE	AUTHOR	DESCRIPTION OF AMENDMENTS
1	25 th October 2024	Fulufhelo Mudau (Environmental Consultant)	Draft IWMP


APPROVAL AND CONTROL SCHEDULE

APPROVED BY	DESIGNATION	RESPONSIBILITY	SIGNATURE	DATE APPROVED
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REPORT STATUS	DRAFT		FINAL	
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EXECUTIVE SUMMARY


Department of Forestry, Fisheries, and the Environment (DFFE) have embarked on a project to support Makana Local Municipality (MLM) within Sarah Baartman District Municipality (SBDM) in developing their Integrated Waste Management Plan (IWMP) as per the requirement of the National Environmental Management Waste Act, Act 59 of 2008 (NEMWA), as amended. Provincial governments and municipalities responsible for waste management are expected to develop and review their IWMPs. Municipalities must submit their IWMPs to the Council for approval and to the Member of Executive Council (MEC) for endorsement, and the endorsed IWMP must be incorporated into Municipal Integrated Development Plan (IDP). The IWMP aims to provide strategic direction for waste management within the Municipality over the short, medium, and long term.

The IWMP will assist the Municipality in improving the current waste management practices which mainly focus on waste collection and disposal to a more improved waste management practice that promotes circular economy and sustainable development, as the waste value-chain would be planned for and managed through the IWMP. The overall objective of an IWMP is to ensure that there is integration and optimisation of general waste, to maximize efficiency and minimise the associated environmental impacts while simultaneously improving the quality of life of the people within the Municipality.

This report is intended to provide an overview of the current waste management practices undertaken as well as the gaps and needs identified within the Municipality. It also indicates the planning context within which the IWMP for the Municipality is formulated, as well as additional legislative frameworks that need to be considered when undertaking the compilation of an IWMP.

Based on current information, from Stats SA, 2022, there has been an increase in population growth from 80 390 which was recorded in 2011 to 97 815 recorded in 2022. Total number of households increased from 21 388 to 29 239. The increased population puts more pressure with regards to the service delivery expected from the Municipality. According to Stats SA, 2022, the municipality is currently collecting waste from 27 632 households and 26 023 according to municipality data.

The Municipality has three operational waste disposal facilities. The Grahamstown waste disposal facility is managed by Mphela Engineers while the Alicedale and Riebeeck East disposal


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facilities are managed by the Municipality. All three disposal facilities have Waste Management Licenses (WML), however, none of them are compliant with the NEM: WA requirements. There are no reclaimers/recyclers at Riebeek East and Alicedale disposal facilities, therefore there is a lot of recyclables disposed at the facility. Riebeek East and Alicedale general waste is being disposed of outside the disposal facilities. All three disposal facilities do not meet the minimum requirements of waste disposal facilities and do not have a weighbridge. Waste recycling is limited within the municipality as numerous waste recyclables are still disposed of at the waste disposal facilities. Grahamstown waste disposal facility is the only site with reclaimers/recyclers allowing an opportunity to maximize the potential of recycling within the Municipality.

The waste characterisation was conducted on the 06th and 07th of February 2024 at all three waste disposal facilities within the MLM. The waste characterisation was conducted towards the end of summer. Various waste streams were identified from the three waste disposal facilities visited in MLM. The various waste streams included High-Density Polyethylene (HDPE), Plastic, Polyethylene terephthalate (PET), polystyrene, clear plastic, mixed plastic, food waste, cardboard, aluminium cans, white paper, glass bottles, textiles, diapers and garden waste.

Illegal dumping is a challenge in the various areas within the municipality, however; the Municipality attempts to manage illegal dumping using the Expanded Public Workers Programme (EPWP) which was under DFFE for a year and ended on the 31 of March 2024. Apart from the EPWP, the Kagiso Trust has been working with the municipality to identify illegal dumping sites. The Kagiso Trust has plans for clean-up campaigns that aim to clean up the identified hotspots and redevelop the area. There are five (5) critical illegal dumping hotspots that the Municipality has been legally ordered to clear regularly by the court, these include Emrhwetyana Joza, Kwakhaya (at the back of Ext10), Ezinjeni ext 6, Ezihagwini ext 6 and Terminus ext7. There are no Producer Responsibility Organisations (PROs) and extended producer responsibility being implemented within the municipality. Challenges that the Municipality encounters include amongst others; limited human resources, air space, illegal dumping, waste operation equipment, and specialized waste management vehicles needed for proper site management.

The Municipality's overall waste management challenges include limited waste management infrastructure, low levels of compliance with the conditions of the waste management disposal facility's license, a lack of specialized waste management fleet, limited landfill airspace, a lack of budgets prioritized and allocated for waste management, and a shortage of experienced and qualified waste management personnel. Poorly managed waste management facilities can emit

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odours, disperse wind, and create frequent fires, all of which impact the environment and cause nuisances and health risks to nearby communities. The impacts of waste management facilities are strongly linked to environmental pollution and climate change since inappropriate waste disposal leads to surface and groundwater pollution as well as Greenhouse Gas (GHG) emissions. Overcoming these challenges requires an integrated approach to waste management.

The analyses of the current waste management system have led to the identification of gaps and needs, and these are addressed with the overarching goals, objectives, and targets in Section 9 of this report.

The main goals for integrated waste management in MLM can be summarized as follows:

- To ensure effective solid waste service delivery;
- To promote waste minimisation and recycling;
- To ensure safe and integrated management of hazardous waste;
- To improve waste education and public awareness;
- To ensure sound budgeting for integrated waste management;
- To improve regulatory compliance; and
- To improve waste information management.


For these goals to be met, a series of implementation instruments (action plans) will need to be implemented. These action plans are detailed in the Implementation Plan in Section 10 of this report. The MLM must action the items proposed in the Implementation Plan as this will directly result in improved waste management of the Municipality.

As part of the development of the IWMP, the consultants will engage with stakeholders and members of the community. Stakeholders and interested and affected parties (I&APs) will be notified that the Draft IWMP is out for comment. The comments on the Draft MLM IWMP will be incorporated into the Final MLM IWMP.

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ABBREVIATIONS

ABBREVIATION DESCRIPTION	
DEDEA	Eastern Cape Provincial, Department of Economic Development and Environmental Affairs
DFFE	Department of Forestry, Fisheries, and the Environment
ECDOH	Eastern Cape Department of Health
EPIP	Environmental Protection and Implementation Programme
EPR	Extended Producer Responsibility
EPWP	Expanded Public Workers Programme
GHG	Greenhouse Gas
HDPE	High Density Polyethylene
IDP	Integrated Development Plan
IWMP	Integrated Waste Management Plan
KPA	Key Performance Areas
MEC	Member of Executive Council
MIG	Municipal Infrastructure Grant
MLM	Makana Local Municipality
NDP	National Development Plan
NDWCS	National Domestic Waste Collections Standards
NEM: AQA	National Environmental Management Air Quality Act (Act 39 of 2004)
NEM: WA	National Environmental Management Act: Waste Act (Act 59 of 2008)
NEM: WAA	National Environmental Management Act Waste Amendment Act (26 of 2014)
NEMA	National Environmental Management Act (Act No 107 of 1998)

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ABBREVIATION DESCRIPTION	
NWA	National Water Act (Act No 36 of 1998)
NWMS	National Waste Management Strategy
PET	Polyethylene terephthalate
PROs	Producer Responsibility Organisations
SA SoER	South African State of Environment Report
SAWIS	South African Waste Information System
SDF	Municipal Spatial Development Framework
SDG	Sustainable Development Goals
WML	Waste Management License
WMO	Waste Management Officer


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DEFINITIONS


WORD	DEFINITION
Business Waste	This means waste that emanates from premises that are used wholly or mainly for commercial, retail, wholesale, entertainment, or government administration purposes.
By-laws	Regulations made by a local authority.
Circular Economy	Circular Economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing, and recycling existing materials and products as long as possible.
Desired End State	It entails identifying priorities and goals that a Municipality wishes to attain regarding waste management.
Disposal	This means the burial, deposit, discharge, abandoning, dumping, placing, or release of any waste into, or onto, any land.
Domestic Waste	This means waste, excluding hazardous waste, that emanates from premises that are used wholly or mainly for residential, educational, health care, sport, or recreation purposes.
Environment	The surroundings in which humans exist include the land, water, and atmosphere. In addition, it includes the interrelationships, combinations, properties, and conditions of all organisms that exist within the surroundings.
Environmental Authorisation	Authorisation by a competent authority of a listed activity or specified activity, in terms of this NEMA, and includes a similar authorisation contemplated in a. Specific Environmental Management Act (SEMA).
Environmental Impact Assessment	Environmental Impact Assessment in planning law, in some circumstances where a development is likely to have significant effects on the environment, a necessary examination of environmental issues before planning can be granted.
Fleet	Comprise of all the transport vehicles owned by a company, government agency, or other business.
General Waste	This means 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;

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WORD	DEFINITION
	(c) business waste; and (d) inert waste.
Hazardous Waste	This means 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.
Industrial symbiosis	A free facilitation service that promotes the exchange of residual resources of one company with another company that can make use of it.
Integrated Waste Management Plan	A statutory requirement of the NEMWA that has been promulgated came into effect on 1 July 2009, to transform the current methodology of waste management, i.e., collection and disposal, to a sustainable practice focusing on waste avoidance and environmental sustainability. The IWMP is a critical sector plan that forms part of the Integrated Development Plan.
Interested and Affected Parties	Interested and Affected Party for Chapter 5 of the NEMA and about the assessment of the environmental impact of a listed activity or related activity, means an interested and affected party contemplated in Section 24(4)(a)(v) of the NEMA and which includes – a) any person, group of persons, or organisation interested in or affected by such operation or activity; and b) any organ of state that may have jurisdiction over any aspect of the operation or activity.
Waste Disposal Facility	This means any site or premise used for accumulating waste to dispose of that waste at that site or on that premise.
MEC	This means the Member of the Executive Council of a province who is responsible for waste management in the province.
Minimisation	When used about waste, it means the avoidance of the amount and toxicity of waste that is generated and, if waste is generated, the reduction of the amount and toxicity of waste that is disposed of.
Municipal Systems Act	Means the Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000).

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WORD	DEFINITION
Municipality	This means a Municipality established in terms of the Local Government: Municipal Structures Act, 1998 (Act No. 117 of 1998).
National Environmental Management Act	Means the National Environmental Management Act, 1998 (Act No. 107 of 1998).
National Environmental Management Waste Act	It is the primary legislation that governs waste management in South Africa.
National Waste Management Strategy	The National Waste Management Strategy (NWMS) is a legislative requirement of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), the “Waste Act”. The purpose of the NWMS is to achieve the objectives of the Waste Act. Organs of the state and affected persons are obliged to give effect to the NWMS.
Partnerships	An association of two or more people as partners.
Projection	Is a potential future evolution of a quantity or set of quantities, often computed with the aid of a model.
Recovery	Means the controlled extraction of a material or the retrieval of energy from waste to produce a product.
Recycle	This means a 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.
Recycling	This means a 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.
Re-use	This means to utilise articles from the waste stream again for a similar or different purpose without changing the form or properties of the articles.
Stakeholder	A person or organisation with a legitimate interest in a project or entity would be affected by a particular action or policy.
Status Quo	The existing state of affairs, especially regarding social or political issues.

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WORD	DEFINITION
Storage	This means the accumulation of waste in a manner that does not constitute treatment or disposal of that waste.
Treatment	This means 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, to minimise the impact of the waste on the environment before further use or disposal;
Waste	This means any substance, material, or object, that is unwanted, rejected, abandoned, 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 other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette
Waste characterisation	The process by which the composition of different waste streams is analysed
Waste Pickers	Someone who collects reusable and recyclable materials from residential and commercial waste bins, waste disposal facilities, and open spaces to revalue them and generate an income.
Waste picker integration	The creation of a formally planned recycling system that values and improves the present role of waste pickers, builds on the strengths of their existing system for collecting and revaluing materials and includes waste pickers as key partners in its design, implementation, evaluation, and revision. Waste picker integration requires changes in a few spheres and includes the integration of waste pickers' work, as well as the political, economic, social, legal, and environmental integration of waste pickers.
Waste Disposal Facility	This means any site or premise used for accumulating waste to dispose of that waste at that site or on that premise.

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WORD	DEFINITION
Waste Management Activity	<p>This means any activity listed in Schedule 1 or published by notice in the <i>Gazette</i> under section 19, and includes—</p> <ul style="list-style-type: none"> (a) the importation and exportation of waste; (b) the generation of waste, including the undertaking of any activity or process that is likely to result in the generation of waste; (c) the accumulation and storage of waste; (d) the collection and handling of waste; (e) the reduction, re-use, recycling, and recovery of waste; (f) the trading in waste; (g) the transportation of waste; (h) the transfer of waste; (i) the treatment of waste; and (j) the disposal of waste.
Waste Management License	<p>This is a license that is issued by a competent authority that authorises an individual/organisation to commence, undertake or conduct a waste management activity under the waste listed activities.</p>
Waste Management Officer	<p>An individual appointed by a local Municipality to coordinate waste management within that Municipality. This individual performs a regulatory function overseeing adherence to national norms and standards and achieving the objectives of the Waste Act.</p>
Waste Management Services	<p>Means waste collection, treatment, recycling, and disposal services.</p>
Waste Minimisation Programme	<p>This means a program that is intended to promote the reduced generation and disposal of waste.</p>
Waste Transfer Facility or Station	<p>This means a facility that is used to accumulate and temporarily store waste before it is transported to a recycling, treatment, or waste disposal facility.</p>
Waste Treatment Facility	<p>This means any site that is used to accumulate waste for storage, recovery, treatment, reprocessing, recycling, or sorting of that waste.</p>

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1 INTRODUCTION

The South African Constitution of the Republic, 1996 (Act 108 of 1996), under Chapter 2 Section 24, stipulates that everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected through reasonable legislative and other measures that prevent pollution and ecological degradation. DFFE supports struggling municipalities that do not have the relevant capacity to ensure that waste services delivery is improved, as such DFFE has embarked on this project to assist MLM as one of the municipalities within the SBDM to develop MLM IWMP.

MLM is one of the seven Local Municipalities within SBDM. MLM is a Category B Municipality which covers an area of 4 376 km². MLM constitutes 7.5 % of the total SBDM area and has a diverse socio-demographic profile underscored by the spatial and physical diversity reflected in all aspects of local development. The Municipality consists of 14 wards of which 3 are found in the rural areas. The municipality consists of four (4) main towns/townships i.e. Makhanda (Grahamstown), Alicedale, Riebeek East, and Sidbury. The key economic sectors are manufacturing agriculture, and business services. MLM has the third largest population in the SBDM, according to Stats 2022, with the total population being 97 815. The Municipality has 29 239 households with an average household size of 3.3.

NEMWA is the primary legislation that governs waste management in South Africa, Section 11 (1) of NEMWA, as amended requires provincial governments and municipalities responsible for waste management to prepare and review their IWMPs. Each Municipality must submit their IWMP that has been approved by the municipal council to the MEC for endorsement, the endorsed IWMP must then be incorporated into the IDP. MLM developed its 1st generation IWMP in 2007, which was reviewed and updated in 2017. This IWMP is, updating and replacing the 2017 IWMP.

The IWMP is developed in line with the updated DFFE guideline for the development of IWMP, the Eastern Cape Provincial Integrated Waste Management Plan (PIWMP) 2022-2026 and aligned with the 2020 National Waste Management Strategy (NWMS) as well as the Provincial IWMP. The goal of the IWMP is to transform the current methods of waste management, i.e. collection and disposal, to a sustainable practice focusing on waste circular economy and environmental sustainability.

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The status quo /situation analysis covers the legislative framework, demographics, waste quantities, and types, as well as the current waste management systems such as waste collection, recycling, treatment, waste disposal, key principles on NWMS 2020, waste pickers, circular economy, and waste management funding. Information was gathered by reviewing existing waste management documents, questionnaires, and ground truthing as well as by conducting interviews.

1.1 Alignment with other Strategic Plans



Several strategic plans at the national, provincial, and local levels have been taken into consideration during the development of this IWMP. A summary of this strategic plan is provided below.

1.1.1 National Waste Management Strategy

The 2020 NWMS is premised on three pillars which are intended to articulate the core objectives of the NEMWA. The pillars include (i) Waste Minimisation, (ii) Effective and Sustainable Waste Services, and (iii) Awareness and Compliance. Each pillar has an expected outcome and associated strategic objectives concerning NEMWA as indicated in **Table 1-1** below.

Table 1-1: 2020 NWMS Strategic Pillars, Goals and Strategic Objectives

STRATEGIC PILLAR 1: WASTE MINIMISATION	
Expected Outcome	Prevent waste, and where waste cannot be prevented ensure – that 40% of waste from diverted from landfills within 5 years; 55% within 10 years; and at least 70% within 15 years leading to zero waste going to landfills.
Key Intervention	<p>Waste Prevention:</p> <ul style="list-style-type: none"> • Prevent waste through cleaner production, industrial symbiosis, and extended producer responsibility; • Prevent food waste by working with agricultural producers, retailers, the hospitality sector, and consumers; and • Increase reuse, recycling, and recovery rates. <p>Waste as a Resource:</p> <ul style="list-style-type: none"> • Divert organic waste from landfills through composting and the recovery of energy; • Divert construction and demolition waste from landfills through beneficiation. • Increase recycling and recovery rates; and

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	<ul style="list-style-type: none"> • Increase technical capacity and innovation for the beneficiation of waste.
NEMWA	<ul style="list-style-type: none"> • 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;

STRATEGIC PILLAR 2: EFFECTIVE AND SUSTAINABLE WASTE SERVICES

Expected Outcome	All South Africans live in clean communities with waste services that are well-managed and financially sustainable
Key Intervention	<p>Waste Collection:</p> <ul style="list-style-type: none"> • Implementation of the separation at source policy to promote reuse, recycling, and recovery of waste, and • Safe and environmentally sustainable disposal of hazardous household wastes. <p>Integrated Waste Management Planning:</p> <ul style="list-style-type: none"> • Cities Support Programme Implementation; and • Effective integrated waste management planning.
NEMWA	<ul style="list-style-type: none"> • Promoting and ensuring the effective delivery of waste services; and • Achieving integrated waste management reporting and planning.

STRATEGIC PILLAR 3: COMPLIANCE, ENFORCEMENT AND COMPLIANCE

Expected Outcome	Mainstreaming of waste awareness and a culture of compliance resulting in zero tolerance of pollution, litter, and illegal dumping
Key Intervention	<ul style="list-style-type: none"> • Reduce Pollution, littering, and illegal dumping; Enhance capacity to enforce the NEMWA and International Agreements on waste and pollution; • Ensure municipal landfill sites and waste management facilities comply with licensing; and • Enhance capacity to monitor compliance and enforce the NEMWA and International Agreements.
NEMWA	<ul style="list-style-type: none"> • Ensure that people are aware of the impact of waste on their health, well-being, and the environment; and

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	<ul style="list-style-type: none"> • Provide for compliance with the measures set out in paragraph (a)-generally, to give effect to section 24 of the Constitution to secure an environment that is not harmful to health and well-being.
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1.1.2 Eastern Cape Provincial IWMP

Eastern Cape Provincial, Department of Economic Development and Environmental Affairs (DEDEA) developed a Provincial Integrated Waste Management Plan (PIWMP) 2022-2026). Eight objectives were defined based on the results of the needs analysis namely:

- Ensure sufficient institutional capacity to implement integrated waste management;
- Improved integrated waste management and future planning;
- Increased waste minimisation, re-use, recycling, and recovery;
- Effective waste information management;
- Improved waste facility management;
- Provide effective and financially viable services;
- Improved education, awareness, and waste information sharing; and
- Effective compliance monitoring and enforcement.

1.1.3 National Development Plan

The 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.

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1.1.4 Sustainable Development Goals

The Sustainable Development Goals (SDGs) comprise seventeen (17) goals that were adopted by the United Nations member states in 2015 to end poverty, improve health and education, reduce inequality, spur economic growth, and tackle environmental issues. SDGs relevant to waste management include:

- SDG 1: No poverty;
- SDG 2: Zero hunger;
- SDG 3: Good health and well-being;
- SDG 4: Quality education;
- SDG 5: Gender equality;
- SDG 6: Clean water and sanitation;
- SDG 7: Affordable and clean energy;
- SDG 8: Decent work and economic growth;
- SDG 9: Industry, innovation and infrastructure;
- SDG 10: Reduced inequalities;
- SDG 11: Sustainable cities and communities;
- SDG 12: Responsible consumption and production;
- SDG 13: Climate action;
- SDG 14: Life below water;
- SDG 15: Life on land;
- SDG 16: Peace, justice, and strong institutions; and
- SDG 17: Partnerships for the goals.



1.1.5 MLM Integrated Development Plan

The Executive Mayor mapped out the strategic direction for the term 2022-2027. The institutional priorities include among others keeping MLM clean and beatified. Provision of a safe, healthy, and secure living environment Key Performance Areas (KPA) for 2023-2027 include the following:

- Recycle initiatives to address Illegal dumping and clean city.
- Establishment of waste material recovery facilities;
- Establishment of Illegal dumping unit;
- Provision of new waste management fleet;
- Eradicate and revamp illegal dumping sites;

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- Compliance and enforcement of environmental by-laws;
- Environmental education, awareness, and Community engagement;
- Notice Boards to discourage littering at problem areas;
- Develop a waste management communication plan.

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2 LEGISLATIVE REQUIREMENTS

This section provides a comprehensive list of applicable National and Provincial legislations, policies, and Guidelines concerning the management of solid waste within the Municipalities.

An understanding of the applicable legal framework is essential when evaluating options for the management of waste. The latest versions of legislation captured here, and their respective amendments can be downloaded from the webpage of the South African Waste Information Centre (SAWIC: <http://sawic.environment.gov.za/>)

The following legal requirements and obligations have an impact on the management of waste within municipalities.



Table 2-1: Applicable national legal requirements and obligations

CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA ACT, 1996 (ACT NO108 OF 1996)

The Constitution of the Republic of South Africa (Act 108 of 1996) is the supreme law of the country and provides the legal foundation for every law developed. Section 24 of the Constitution states that everyone has a right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislation development and implementation and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development. As such, fundamental rights in the Constitution must be taken into consideration during waste management planning.

THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO 107 OF 1998) (NEMA)

The National Environmental Management Act (Act No.107 of 1998) (NEMA) as amended is the framework Act dealing with environmental management in South Africa. It imposes a duty of care on every person who causes environmental degradation to put measures in place to stop, reduce or rectify the pollution as it occurs. The environmental impact assessments that are required for the establishment and management of waste facilities are conducted under this legislation. The national environmental management principles in Section 2 of the Act provide for the sound management of the environment, which includes waste aspects such as the polluter pays, duty of care, proximity, regionalization and cradle-to-grave principles. Section 24 of the Act makes provision for the application and enforcement of waste management licenses. Section 25 of the Act provides for the incorporation

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of international environmental instruments – Accession to, ratification, and introduction of legislation giving effect to an international environmental instrument to which the country is a party. The duty of care and the remediation of environmental damage are addressed in Section 28 of the Act. The principles enunciated in the NEMA need to inform waste management decision-making and practices.

A key aspect of NEMA is that it provides a set of environmental management principles including Precautionary, Polluter pays and Prevention and duty of care as well as the Waste Management Hierarchy (**Figure 2-1**) that apply throughout the Republic to the actions of all organs of state that may significantly affect the environment. In addition, Section 28 of NEMA, affectionately known as the “duty of care” provision, requires persons who are defined in the section to take reasonable measures to combat pollution or degradation of the environment.

NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE MANAGEMENT ACT, 2008 (ACT NO. 59 OF 2008) (NEMWA)

The National Environmental Management Act: Waste Act (Act 59 of 2008) (NEMWA) as amended regulates waste management to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation, and for securing ecologically sustainable development. This is aimed at providing for institutional arrangements and planning matters; providing for national norms and standards for regulating the management of waste by all spheres of government; providing for specific waste management measures; to provide for the licensing and control of waste activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

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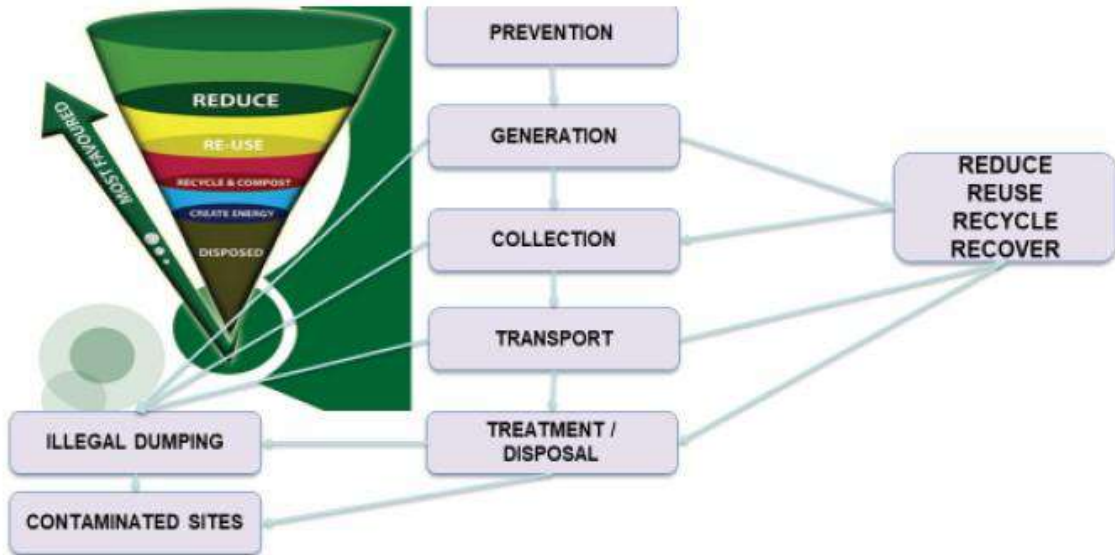


Figure 2-1: Waste Management Hierarchy

THE NATIONAL WASTE INFORMATION REGULATION (GNR 625 OF 2012)



This notice illustrates the regulations for the collections of data and information to fulfil the objectives of the National Waste Information System (SAWIS) set out in Section 61 of the NEMWA. The list of activities requiring registration and reporting on the SAWIS includes general waste disposal facilities that receive more than 150 tons of waste per day, recycling and treatment facilities, hazardous waste being exported or imported as well as energy recovery facilities.

NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT: NATIONAL WASTE INFORMATION REGULATIONS, JANUARY 2013

These Regulations instruct waste generators and holders to register and report to the National and Provincial waste information systems.

THE NATIONAL DOMESTIC WASTE COLLECTION STANDARDS (GNR 21 OF 2011)

This notice aims to standardize waste service delivery to ensure that this service is available to all while complying with current health and safety legislations as well as minimally changing those waste collection processes that function effectively and efficiently. The National Domestic Waste Collections Standards (NDWCS) also specify that recyclables that are not collected at households should be

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The listed waste activities under Sections 19 and 20 of Chapter 4 of NEMWA are published in Government Notice 921 of 2013 as Category A; activities requiring a Basic Assessment (BA) process (applicable to general waste), Category B; activities requiring a Scoping and Environmental Impact Assessment (EIA) process (applicable to hazardous waste) set out in Section 24(5) of NEMA (Act No. 107 of 1998), as part of the waste management license application contemplated in Section 45 read with Section 20(b) of the Act. The main activities in terms of Categories A and B for which a waste license may be required.

THE NATIONAL NORMS AND STANDARDS FOR THE REMEDIATION OF CONTAMINATED LAND AND SOIL QUALITY IN THE REPUBLIC OF SOUTH AFRICA (GN 467 OF 2013)

The purpose of the norms and standards is to provide for a uniform, national approach relating to the remediation of contaminated land.

THE NATIONAL NORMS AND STANDARDS FOR THE STORAGE OF WASTE GNR 926 OF 2013



The purpose of these norms and standards is to provide a uniform national approach to the management of waste facilities and to ensure that best practice in the management of waste storage facilities is achieved. This document also outlines the minimum standards for the design and operation of new and existing waste storage facilities.

Part 1 of this document outlines the requirements for registration, what factors to consider when selecting a location and finally the requirements for the construction and design of the proposed waste storage facility.

Part 2 of these norms and standards outlines the requirements for the management of waste storage facilities. Aspects such as access control, notices/signage, waste storage containers and minimum requirements for above and underground waste storage facilities are outlined in this section. This is applicable to facilities such as the landfill sites.

THE NATIONAL NORMS AND STANDARDS FOR DISPOSAL OF WASTE TO LANDFILL GNR 636 OF 2013

These Norms and Standards determine the requirements for the disposal of waste to landfills as contemplated in regulation Section 8(1) (b) and (c) of the Waste Classification and Management Regulations. Chapter 2 outlines and illustrates Landfill Classification and Containment Barrier Design. Waste assessed in terms of the Norms and Standards for Assessment of Waste for Landfill Disposal in terms of Section 7(1) of the Act must be disposed to a licensed landfill.

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WASTE TYRE REGULATION GNR 149 OF 2009

Waste Tyre Regulation regulates the management of waste tyres by providing regulatory mechanisms.

THE WASTE CLASSIFICATION AND MANAGEMENT REGULATIONS (GNR 634 OF 2013)

The purpose of this Regulation is to regulate the classification and management of waste in manner which supports and implements the provisions of NEMWA; to establish a mechanism and procedure for the listing of waste management activities that do not require a Waste Management License; to prescribe requirements for the disposal of waste to a landfill; to prescribe general duties of waste generators, transporters and managers.

THE NATIONAL NORMS AND STANDARDS FOR THE SCRAPPING OR RECOVERY OF MOTOR VEHICLES GNR 925 OF 2013

The National Norms and Standards for the Scrapping or Recovery of Motor Vehicles aim at controlling the scrapping or recovery of motor vehicles at a facility with an operational area in excess of 500 m² in order to prevent or minimize potentially negative impacts on the biophysical and socio-economic environment.



THE NATIONAL NORMS AND STANDARDS FOR THE ASSESSMENT OF WASTE FOR LANDFILL DISPOSAL (GNR 635 OF 2013)

The National Norms and Standards for the Assessment of Waste for Landfill Disposal prescribes the requirements for the assessment of waste prior to its disposal to landfill in terms of Regulation 8(1)(a) of the regulations. It is the responsibility of the Municipality to ensure compliance with the waste quality prior to its disposal at landfill.

THE NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT: WASTE CLASSIFICATION & MANAGEMENT REGULATIONS (GOVERNMENT GAZETTE NO. 36784, 23 AUGUST 2013)

The Regulations serve to regulate the classification and management of waste in a manner that supports and implements the provisions of the Waste Act and provide for safe and appropriate handling, storage, recovery, reuse, recycling, treatment and disposal of waste and will also enable accurate and relevant reporting on waste generation and management.

NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT: NATIONAL NORMS AND STANDARDS FOR DISPOSAL OF WASTE TO LANDFILL (GOVERNMENT GAZETTE NO. 36784, 23 AUGUST 2013)

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These Norms and Standards determine the requirements for the disposal of waste to landfill as contemplated in Regulation 8(1) (b) and (c).

NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT: NATIONAL NORMS AND STANDARDS FOR ASSESSMENT OF WASTE TO LANDFILL (GOVERNMENT GAZETTE NO. 36784, 23 AUGUST 2013)

These Norms and Standards prescribe the requirements for the assessment of waste prior to disposal to landfill in terms of Regulation 8(1) (a).

NATIONAL NORMS AND STANDARDS FOR THE SORTING, SHREDDING, GRINDING, CRUSHING, SCREENING OR BAILING OF GENERAL WASTE (GNR 1093 OF 2017)

The purpose of these Norms and Standards is to provide a uniform national approach relating to the management of waste facilities that sort, shred, grind, crush, screen, chip or bale general waste, with an operational area that is 1000m² and more. Waste facilities with less than 1000m² are to comply with Section 4(4) of the Norms and Standards only, which requires that the facility must be registered with the Competent Authority and comply with the principles of the duty of care as contained in Section 28 of the NEMA.

The Norms and Standards require that the Municipality ensure-

All new waste facilities must be registered 90 days prior to any construction taking place;

Existing waste facilities must register within 90 days of the publishing of the Norms and Standards (i.e. on or before 09 January 2018);



Those waste facilities that are already registered do not need to re-register but must comply with the Norms and Standards from 11 October 2017; and

A waste facility that is less than 1000m² must, inter alia, register in terms of the Norms and Standards.

REGULATIONS REGARDING THE EXCLUSION OF WASTE OR A PORTION OF A WASTE STREAM FROM THE DEFINITION OF WASTE (GN R 715 OF 2018)

The purpose of these regulations are as follows: Prescribe the manner in which a person or a category of persons may apply to the Minister for exclusion of a waste stream or a portion of waste for beneficial use from the definition of waste; Exclude permitted uses of a waste stream or a portion of waste from the definition of waste; and Promote diversion of waste from landfill disposal to its beneficial use.

THE NATIONAL WASTE MANAGEMENT STRATEGY GNR 2020

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The National Waste Management Strategy (NWMS,2020) is a legislative requirement of NEMWA. The purpose of the NWMS is to give effect in achieving the objectives outlined in the NEMWA. The 2020 NWMS is a revision and update of the 2020 NWMS. Organs of state and affected persons are obliged to give effect to the NWMS. The 2020 NWMS is structured around central implementation themes that are described in terms of strategic objectives and actions:

Theme 1: Waste Minimisation

Theme 2: Effective and Sustainable Waste Services

Theme 3: Waste Awareness and Compliance

The NWMS's overall aim is to reduce the generation and environmental impacts associated with poor waste management. It presents a plan on how to achieve the desired goals outlined in the document which will ultimately promote a cleaner, healthier environment within South Africa.

DFFE INTEGRATED WASTE MANAGEMENT GUIDELINES



The guidelines provide a background for the compilation of Integrated Waste Management Plans which includes a short historical overview of IWMP's to date and a basic description of the legal framework about IWMP development.

THE LOCAL GOVERNMENT MUNICIPAL STRUCTURES ACT, 1998 (ACT 117 OF 1998)

This Act provides for the establishment of municipalities in accordance with the requirements relating to categories and types of municipalities. It establishes criteria for determining the category of municipality to be established in an area and defines the types of municipalities that may be established within each category. The Act furthermore provides for an appropriate division of functions and powers between categories of municipalities and regulates the internal systems, structures and office-bearers of the municipalities. It also provides for appropriate electoral systems for matters in connection therewith.

THE LOCAL GOVERNMENT MUNICIPAL SYSTEMS ACT, 2000 (ACT 32 OF 2000)

Section 25 of the MSA, requires each municipal council to within a prescribed period after the start of its election term, adopt a single, inclusive and strategic IDP, for the development of the Municipality. In relation to waste management, the IDP is required to include sectorial environmental plans which would be an IWMP for waste management. In their IDP's municipalities are required to ensure proper resource allocation to achieve the targets set in the respective plans. Section 13 of the Act provides for the publication of relevant By-laws by the municipal council in the Provincial Gazette and where

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feasible in a local newspaper or in any other practical way to bring the contents of the By-law to the attention of the local community.

THE LOCAL GOVERNMENT MUNICIPAL FINANCE MANAGEMENT ACT, 2003 (ACT 56 OF 2003)

This Act provides for the secure and sustainable management of the financial affairs of municipalities and other institutions in the local sphere of government.

MAKANA LOCAL MUNICIPALITY WASTE MANAGEMENT BY-LAWS



The main objectives of these By-laws are to;

- a) ensure that waste is avoided, or where it cannot altogether be avoided, minimized, re-used, recycled, recovered and disposed of in an environmentally sound manner;
- b) promote sustainable development and environmental justice through fair and reasonable measures for management of waste within the Council's jurisdiction;
- c) regulate the collection, transportation, storage, disposal, treatment and recycling of waste within the Council's jurisdiction;
- d) regulate and ensure effective delivery of the municipal service and regulate the provision of commercial services through accreditation of service providers; and
- e) ensure that all municipal residents and businesses in the Council's jurisdiction participate in the promotion of responsible citizenship by ensuring sound waste management practices within residential and industrial environments.

THE NATIONAL WATER ACT, 1998 (ACT 36 OF 1998) (NWA)

The National Water Act (Act No. 36 of 1998) (NWA) contains several provisions that impact waste management, including the disposing of waste in a manner, which detrimentally impacts on a water resource and the discharge of waste into a water resource. 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; and
- 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.

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

MUNICIPAL SOLID WASTE TARIFF STRATEGY (2012)



The purpose of the Municipal Solid Waste Tariff Strategy is to provide a framework and guidance for municipalities in setting solid waste tariffs that align with the intentions of the NWMS. The NWMS recognizes the importance of full cost accounting as the foundation of financial sustainability, which is critical in the delivery of effective and efficient waste services and in the promotion of waste minimization, reuse, recycling and recovery. Full cost accounting considers all operational and capital expenditure pertaining to solid waste services. The introduction of cost-recovery tariffs enables municipalities to fund the “maintenance, renewal and expansion of solid waste infrastructure” (NWMS, 2011). The under-pricing of waste services sends inappropriate signals to households and waste generators and discourages waste minimisation. Inadequacies in municipal solid waste tariff setting have been raised by National Treasury (National Treasury, 2011). The strategy aims to reflect the principles that need to be adhered to in solid waste tariff setting and provides guidance in achieving the correct balance between appropriate subsidization and full cost recovery.

THE NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT 39 OF 2004

The National Environmental Management: Air Quality Act 39 of 2004 (NEM: AQA) as amended reforms the law regulating air quality to protect the environment by providing measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; provides for national norms and standards regulating air quality monitoring, management and control of all spheres of government; for specific air quality measures; and matters incidental thereto. This Act is furthermore relevant to the management of waste as it may impact air quality and ultimately contribute to the mitigation of climate change.

THE OCCUPATIONAL HEALTH AND SAFETY ACT, 1993 (ACT 85 OF 1993) AND REGULATIONS

The Occupational Health and Safety Act, Act 85 of 1993 contains provisions that protect waste workers from harm during the waste management process. The Act provides for the development of regulations that protect workers and the public from exposure to asbestos, hazardous chemicals, hazardous waste and lead. The Occupational Health and Safety Act and its regulations are of importance to the management of the health and safety of workers responsible for the handling of waste. This Act could also apply to waste harvesters if they are allowed by a Municipality to reclaim waste.

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THE NATIONAL HEALTH ACT (ACT 61 OF 2003)

The National Health Act (Act No. 63 of 2003) provides measures for the promotion of health and Section 20 of the Act sets out the duties and powers of local authorities. It provides that every local government is obliged to take measures to maintain its district in a clean and hygienic condition and to prevent the occurrence of any nuisance, unhygienic or offensive condition, or any other condition, which could be of danger to the health of any person. A “nuisance” includes any accumulation of refuse or other matter that is offensive or is injurious or dangerous to health. The local government is obliged to abate the nuisance or remedy the condition and to prevent the pollution of any water intended for the use of the inhabitants of its district.

THE NATIONAL HEALTH ACT, ACT 2003 (ACT 63 OF 2003)

This act provides a framework for a structured uniform health system within the Republic, taking into account the obligations imposed by the Constitution and other laws on the national, provincial and local governments concerning health services.



THE HAZARDOUS SUBSTANCES ACT, 1973 (ACT 15 OF 1973) & REGULATIONS

This legislation aims to address substances that are deemed hazardous, to regulate and prohibit the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances. In terms of waste management, Section 29 of the Hazardous Substances Act stipulates that the Minister has the designated authority to authorise, regulate or prohibit the dumping of hazardous substances. Industries that generate hazardous waste must produce an industrial waste management plan. Industries such as small-scale mines and other industries within the municipalities are expected to comply with this Act and the By-laws must incorporate this in their systems.

NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998): ENVIRONMENTAL IMPACT ASSESSMENT (“EIA”) REGULATIONS, 18 JUNE 2010

These regulations standardise the procedure and criteria as contemplated in Chapter 5 of the NEMA relating to the submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities to avoid detrimental impacts on the environment, or where it cannot be avoided, ensure mitigation and management of impacts to acceptable levels, and to optimise positive environmental impacts, and for matters pertaining thereto.

THE FERTILIZERS, FARM FEEDS, AGRICULTURAL REMEDIES AND STOCK REMEDIES ACT (ACT 36 OF 1947)

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This legislation regulates the import, sale, acquisition, disposal or use of fertilizers, farm feeds, agricultural remedies and stock remedies. The Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, Act 36 of 1947 regulates the importation, sale, acquisition, disposal or use of fertilizers, farm feeds, agricultural remedies (pesticides), and stock remedies. This Act has relevance to compost where it is intended for use as a fertilizer and digestate from anaerobic digestion plants intended as fertilizers. It also regulates the disposal of farm feeds, obsolete agricultural remedies (pesticides) and fertilizers.

NATIONAL ORGANIC WASTE COMPOSTING STRATEGY: DRAFT STRATEGY REPORT AND GUIDELINE (FEBRUARY 2013)

The national organic draft strategy has been developed to promote composting as one method to benefit organic waste and to divert organics from landfill disposal. The Guidelines aim to provide a practical conceptual-level information tool to assist authorities and other interested parties in identifying viable and sustainable composting opportunities

THE NATIONAL NORMS AND STANDARDS FOR ORGANIC WASTE COMPOSTING GN 561 OF 2021

The National Norms and Standards for Organic Waste Composting aim at controlling the composting of organic waste at a facility that falls within the threshold of these norms and standards to prevent or minimize potentially negative impacts on the biophysical and socio-economic environment

CONSUMER PROTECTION ACT (CPA), 2008 (ACT 68 OF 2008)



Section 59 of this act provides for producers, suppliers or distributors of goods (designated products or their components) that may not be disposed of into a common waste collection system to be recovered and safely disposed.

EXTENDED PRODUCER RESPONSIBILITY (GN 1184 OF 2020)

Aims to provide the framework for the development, implementation, monitoring and evaluation of extended producer responsibility schemes by producers in terms of section 18 of the NEM: WA.

INTERNATIONAL AGREEMENTS

BASEL CONVENTION 22 MARCH 1989

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This convention is an international treaty that controls the transboundary movements and disposal of hazardous waste (excluding the movement of radioactive waste) between nations and prevents the transfer of hazardous waste from developed to less developed countries

ROTTERDAM CONVENTION 10 SEPTEMBER 1998

The Rotterdam Convention promotes shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals to protect human health and the environment from potential harm and to contribute to their environmentally sound use, by facilitating information exchange about their characteristics and by providing for a national decision-making process on their import and export. The Convention aims to facilitate informed decision-making by countries regarding the trade in hazardous chemicals.

STOCKHOLM CONVENTION 22 MAY 2001

The Stockholm Convention aims to protect human health and the environment from persistent organic pollutants. The Convention listed 24 chemicals including Polychlorinated Biphenyls (PCBs) as chemicals that possess toxic properties, resist degradation, bio-accumulate and are transported through air, water and migratory species, across international boundaries and deposited far from their place of release where they accumulate in terrestrial and aquatic ecosystems, known as persistent organic pollutants (POPs).



MINAMATA CONVENTION 16 AUGUST 2017

The Minamata Convention on Mercury is intended to protect human health and the environment from the adverse effects of mercury. The Convention draws attention to a global and pervasive metal that, while naturally occurring, has broad uses in everyday objects and is released to the atmosphere, soil and water from a variety of sources. Controlling the anthropogenic releases of mercury throughout its lifecycle has been a key factor in shaping the obligations under the Convention.

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3 INTEGRATED WASTE MANAGEMENT PLANNING PROCESS

The primary objective of IWMP is to integrate and optimise waste management planning to maximise efficiency and minimise the associated environmental impacts and financial costs, and to improve the quality of life for all South Africans. The diagram below (Figure 3-1) summarises the integrated waste management planning process that has been adopted for this process.

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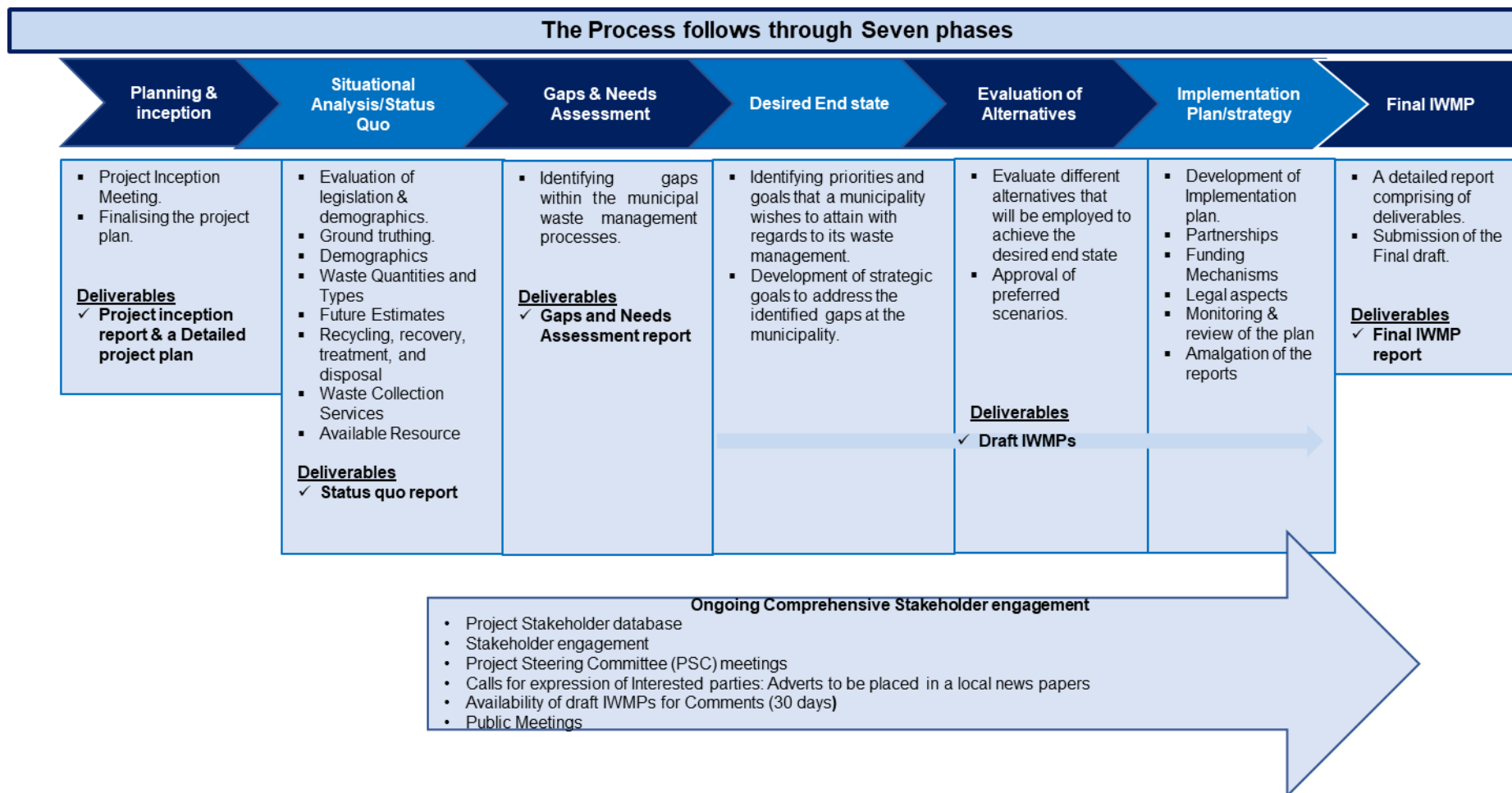


Figure 3-1: Integrated Waste Management Planning Process.

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4 WASTE SITUATION ASSESSMENT

The development of an IWMP includes a situation analysis which entails a description of the population and development profiles to which the plan relates, an assessment of waste quantities and types of waste generated within the Municipality, a description of the services that are available for the collection, minimisation, re-use, recycling, and recovery, treatment, and disposal of waste. Moreover, the situation analysis is also completed in terms of institutional, financial, legal, and physical conditions which must also be translated into the desired end state.

4.1 Situational Analysis Methodology

The information for compiling the status quo report was collected from the following sources:

- Makana Local Municipality Integrated Development Plan 2023/24;
- Makana Local Municipality Integrated Waste Management Plan 2017;
- Makhandha (Grahamstown) Landfill site License;
- Interviews with key stakeholders on the 06th and 07th of February 2024 e.g., recyclers and municipal officials;
- Eastern Cape Provincial Integrated Waste Management Plan 2022-2026;
- DFFE IWMP Guideline;
- Site visits and waste characterisation conducted on the 06th and 07th February 2024; and
- Stats SA (2011 and 2022).

4.2 Geographical Area

This section describes the location and demographics of MLM to provide a comprehensive background of the municipality.

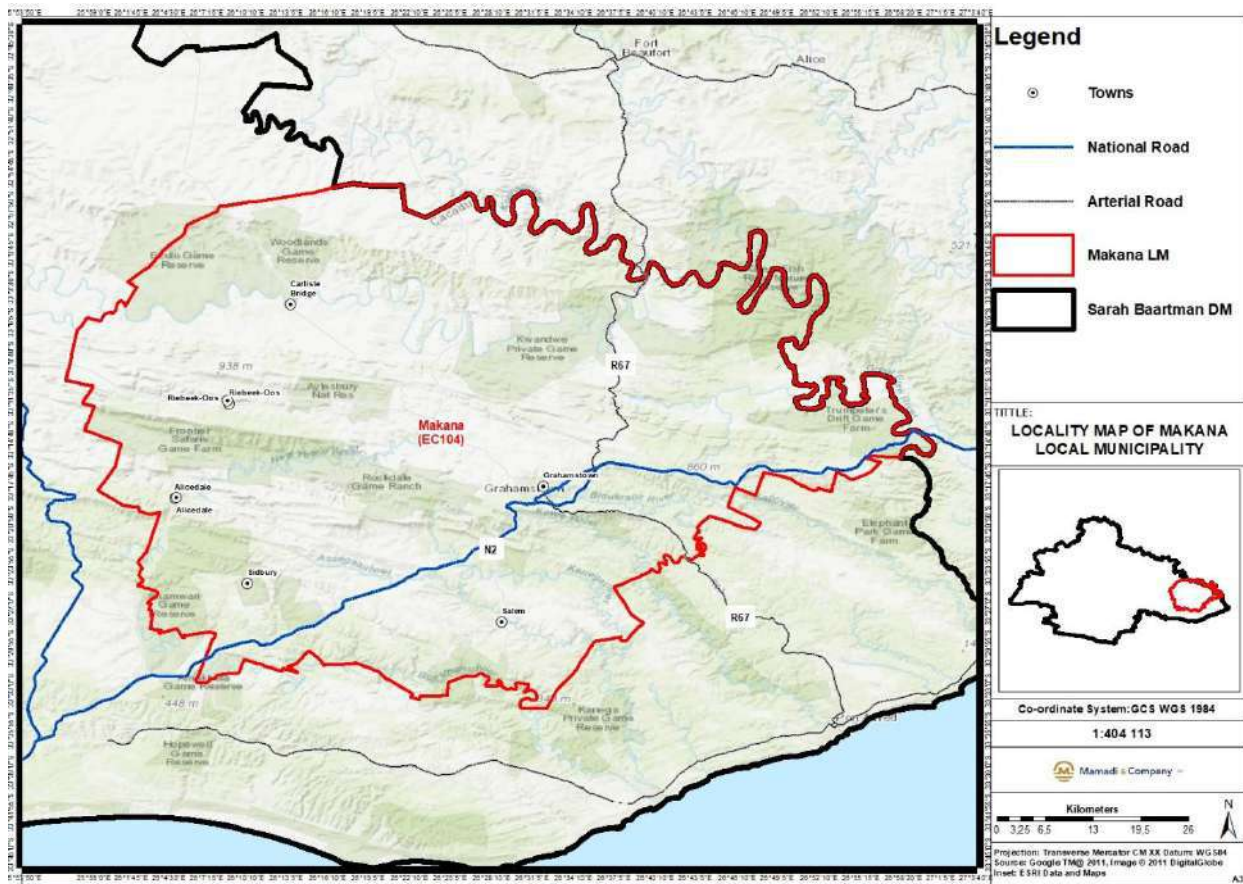
4.2.1 Locality


MLM is one of the seven Local Municipalities within SBDM. MLM is situated in the Eastern Cape Province on the southeastern seaboard of South Africa and the western part of the Eastern Cape Province. MLM is in the eastern of the SBDM, with the cities of Port Elizabeth 120km to the West and East London 180km to the East. MLM has the third largest population in the SBDM, according to Stats 2022, with the total population being 97 815. The Municipality has 29 239 households with an average household size of 3.3. MLM is a Category B Municipality which covers an area of 4 376 km² and constitutes 7.5 % of the total SBDM area. MLM has a diverse

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socio-demographic profile underscored by the spatial and physical diversity reflected in all aspects of local development. The Municipality consists of 14 wards of which 3 are found in the rural areas. The municipality consists of four (4) main towns/townships i.e. Makhanda (Grahamstown), Alicedale, Riebeek East, and Sidbury. The key economic sectors are manufacturing agriculture, and business services. MLM has the largest population in the Sarah Baartman, according to Stats 2022, the total population is 97 815. The Municipality has 29 239 households with an average household size of 3.3. **Figure 4-1** and **Figure 4-2** show the locality map of MLM and waste disposal facilities within MLM.

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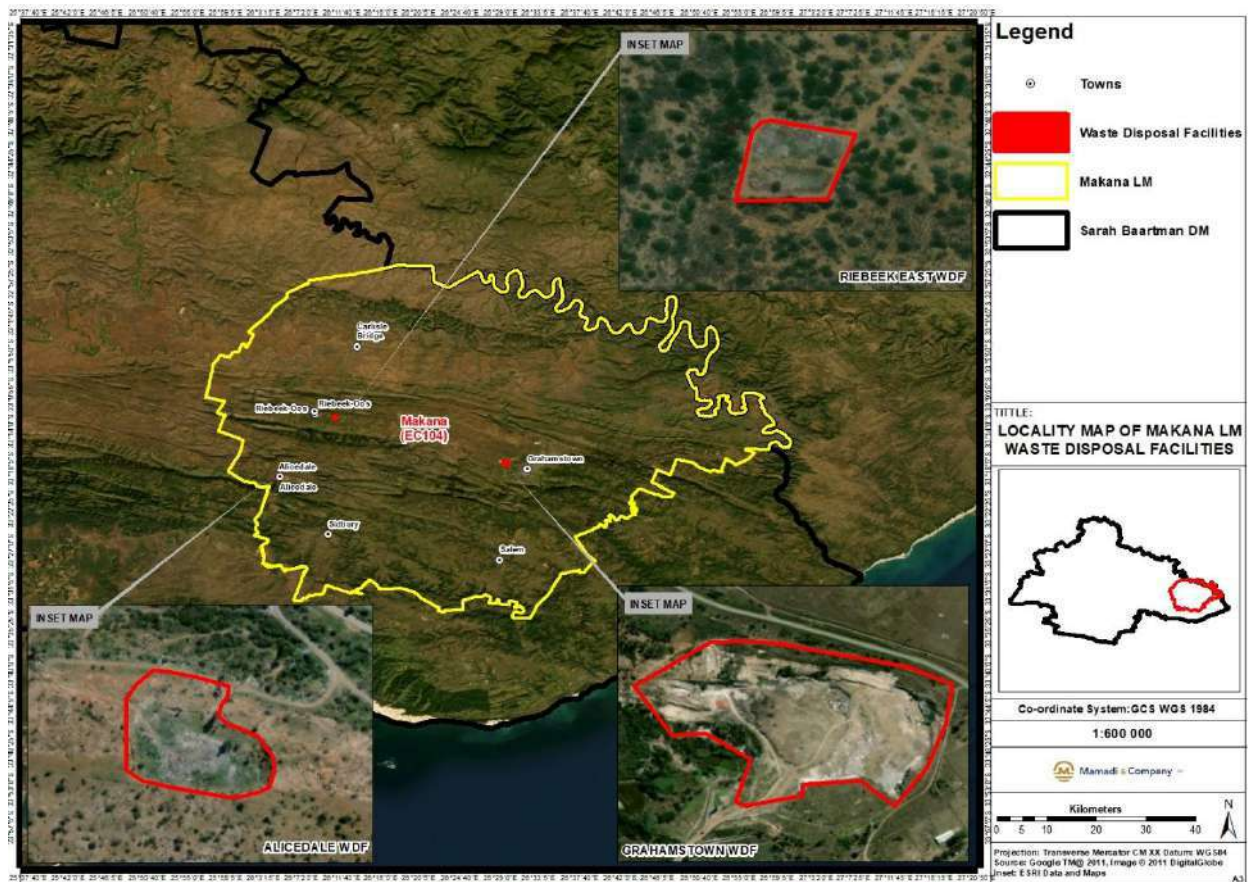




Figure 4-2: Map showing MLM Waste Disposal Facilities

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4.2.2 Climate

The Makhanda (Grahamstown) area experiences moderate weather conditions. Rain falls throughout the year with mean precipitation averaging 680mm. Summer temperatures (January) vary from an average maximum of 26°C to a minimum of 15°C. In winter (July) temperatures vary from an average maximum of 18°C to an average minimum of 4°C. The Southern portion of the municipality has the highest rainfall. The majority of the municipality is classified as semi-arid. MLM lies in a subtropical climatic zone, meaning that the area is characterized by warm summers and cool winters and fairly evenly distributed rainfall throughout the year. The prevailing wind direction is from the west and southwest.


In Alicedale, rainfall is approximately 555mm per year. Temperatures in Alicedale range from 40°C to 15°C in summer and 18°C to -8°C in the winter months. Rainfall in the Riebeek East area is approximately 865mm per year, with identical average winter and summer temperatures to those experienced in Makhanda.

4.2.3 Topography

Makhanda is situated in a valley that cuts into a plateau. The eastern part of the municipality can be classified as lowlands, with contours generally lying below 300m above sea level. The western part of the locality in which Alicedale is situated can be classified as being of a moderate elevation, lying between 300m and 600m above sea level. The central part of the municipality that contains Makhanda and Riebeek East has the highest elevation of between 600m and 900m above sea level. Riebeek East is located 630m above sea level. The highest point on the plateau is 770m above sea level and the lowest point in the valley is 490m above sea level. Alicedale is located about 360m above sea level in a flood plain created by the confluence of the Bushman's River and the New Year's River. Most of the land in MLM has a slope of either between 3-8° or between 8-20°.

4.2.4 Geology

The region encompasses diverse geological formations, including the Dwyka Formation, Ecca Group, Uitenhage Group, and Suurberg Groups. **Figure 4.3** indicates the general pattern of the geology within the Municipality. This distribution shows there are five geological formations in MLM.

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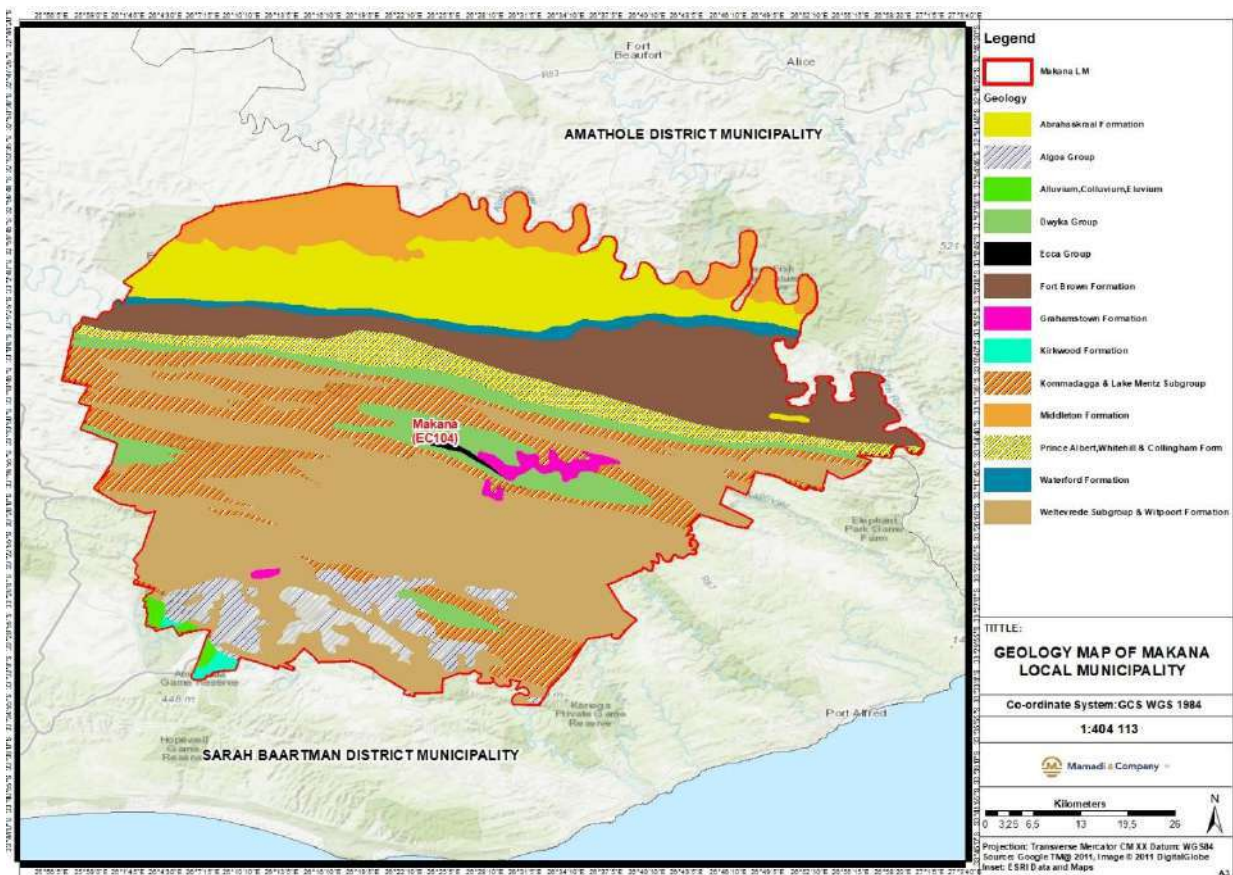



Figure 4-3: Geology Map of MLM


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4.2.5 Hydrology

Orange-Fish-Sundays water supply system which ensures continuous sustainable water supply is the major water-related driver in the municipal area. Makhandha's water is from local dams and sources transferred from the Orange River. There is an adequate supply of water but there is also a need for more groundwater development. Riebeek East's water is sourced from local boreholes with adequate supply. Alicedale's water is sourced from a local New Year dam. The whole municipality is classified as a primary catchment area, with a mean quaternary runoff of between 12m³ and 40m³.

Groundwater is provided by boreholes and springs that are evenly distributed throughout the municipality. Surface water is largely provided by dams and reservoirs that are linked to perennial and non-perennial rivers.

Several rivers are found within the Municipality, which includes the Bloukrans, Bushmans, Great Fish, Kowie, Kariega, and Palmiet/Berg River. The Bloukrans River rises near Makhandha, then flows in a south-easterly direction, later joining the Kowie River. Bushmans River is located near Alicedale. **Figure 4-4** shows the distribution of the rivers and tributaries through the Municipality.

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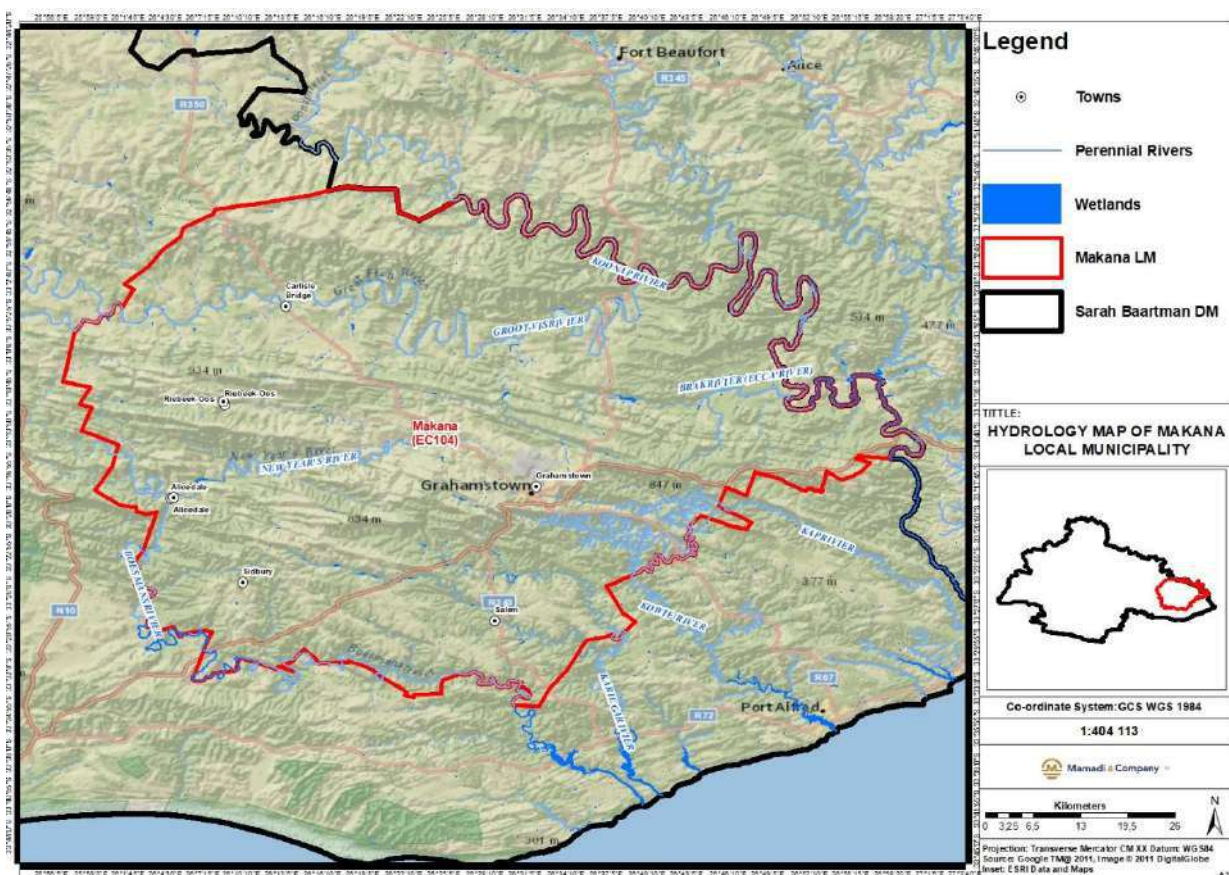




Figure 4-4: Hydrological Map of MLM

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4.3 Demographics Profile and Population Growth

This section highlights the socio-economic aspects such as population, education, employment, and income levels at the Municipality. According to the DFFE IWMP Guideline, demographic data is required to calculate projections of current and future waste quantities. Furthermore, this information is required to:

- Assess the required resources and infrastructure to provide effective waste management services.
- Ensure that previously un-serviced areas, such as informal settlements (i.e. high-density areas, usually on the periphery of urban areas that are characterised by structures such as “shacks”) and rural (low-density areas usually a greater distance from urban areas and also referred to as “villages”) or sparsely populated areas are considered.
- Evaluate the potential for financial recovery; and
- Form the basis for projected waste volumes and types.

Understanding the demographic profile of the Municipality will provide a clear indication of the socio-economic factors that influence waste generation, in particular population (which gives a direct indication of waste generation values), education (which may have a bearing on awareness and waste management education), employment and income (which indicates access to waste management services). Aspects within demographics also allow for the analysis of factors that may influence attitudes and behaviours relating to waste management. Importantly, socio-economic factors emphasise the level of user affordability, which serves as a key aspect to be considered for appropriate budgeting and costing. This also shows areas that require more attention and financial assistance. **Table 4-1** below details the demographic profiles for MLM.




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Table 4-1: Growth and Demographic Profiles

POPULATION GROWTH		
Municipality Total Population (Stats SA, Census 2022)	97 815	
Estimated Population Growth Rate (%) (Stats SA, Census 2022)	1.97%	
Municipality Total Population (Stats SA, Census 2011)	80 390	
Estimated Population Growth rate (%) (Stats SA, Census 2011)	0.61%	
Municipality Total Population (Community Survey 2016)	82 060	
DEMOGRAPHIC PROFILES		
AGE		
Young	21.9%	21 421
Middle Age/ Working Age	68.9%	68 275
Old Age	8.2%	8 021
GENDER		
Male	46.6%	45 582
Female	53.4%	52 233
EDUCATION		
No Schooling	3.8%	3 717
Tertiary	16.6%	16 237
POPULATION GROUPS		
Black African	73.9%	72 213
Colored	12.5%	12 223
Indian/Asian	0.9%	844
White	11.3%	11 095
Other	1.4%	1 402

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4.3.1 Employment Status and Economic Performance of MLM.

MLM's economically active population was 39,600 in 2020, which is 43.38% of its total population of 91,400, and roughly 17.59% of the total economically active population of the SBDM. From 2010 to 2020, the average annual increase of the active population in the MLM was 2.69%, which is 0.0887% lower than the growth of Sarah Baartman's for the same period.

According to the MLM 2020 economic profile, a total of 24 800 people which is 15.82% of the total employment in SBDM and 1.79% of the total employment in Eastern Cape Province. Employment within MLMs increased annually at an average rate of 0.72% from 2010 to 2020.

A total of 24,800 people within the MLM were employed in various economic sectors. The community services sector recorded the largest number of employment in 2020 with a total of 6 500 employed people or 26.2% of total employment within the municipality. followed by the trade sector with a total of 5 090 (20.5%). The mining sector with 1.44 (0.0%) has the least number of employees in MLM, followed by the electricity sector with 32.4 (0.1%) people employed.

From the 24 800 people recorded to be employed in 2020 within the municipality, the number of formally employed people accounted for 18 200, which is about 73.60% of total employment, while the number of people employed in the informal sector counted 6 540 or 26.40% of the total employment. Informal employment in MLM increased from 5 730 in 2010 to an estimated 6 540 in 2020.

In 2020 the trade sector recorded the highest number of informally employed accounting for 2 260 employees or 34.56% of the total informal employment. The trade sector requires fewer skills and capital as compared to other sectors, therefore there are fewer barriers to entering this sector. The manufacturing sector has the lowest informal employment with 440 and only contributes 6.72% to total informal employment.



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Table 4-2: Employment Status for MLM

EMPLOYMENT STATUS	STATS 2011
Employed	19 234
Unemployed	9 260

4.3.2 Income Groups

Income statistics is not included in Stats SA, 2022, as a result, Stats SA 2011 averages were used with the assumption that all income groups grew at the same rate. MLM has 77% of its households falling within the low-income level and only about 2% in the high-income level. Table 4.3 details the development profile of the MLM.

Table 4-3: MLM Income Groups (Stats 2011)



INCOME LEVELS	HOUSEHOLDS	%
Low income (No income – R76 400)	22 824	77%
Middle income (R76 401 – R614 400)	6 314	21%
High income (R614 001 – R2 457 601 or more)	593	2%

4.3.3 Dwelling Types

According to Stats SA 2022, the Municipality has 29 239 households. **Table 4-4** details household dwelling types based on Stats SA 2022.

Table 4-4 Households Dwelling Types (Stats SA 2022)

DWELLING TYPES		
Formal dwelling	26 206	89.6%
Traditional dwelling	338	1.2%
Informal dwelling	2 574	8.8%
Other	120	0.4%

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4.3.4 Future Population

If the current population of MLM grows at a constant rate of 1.97% per decade (Statistics SA, 2022), over five years, the population of this Municipality is estimated to be 107 831 persons as per the calculation below:

$$\text{Pop}_{\text{future}} = \text{Pop}_{\text{present}} (1+i)^n$$

$$\text{Pop}_{\text{future}} = 97\,815 ((1+(1.97))^5)$$

$$= 97\,815 (1.1024)$$

$$= 107\,831$$

Calculation Index :

Pop_{Future} - Future Population

Pop_{present} - Present Population as per (Stats SA, 2022)

i - Growth rate as per Stats SA, 2022

n - No of years

The equation above was used to calculate the future population over 10 years for the years 2032, 2042, and 2052 (up to 30 years) for MLM in **Table 4-5** below.

Table 4-5: MLM Population Growth Projections

CENSUS (2022)	ESTIMATED (2032)	ESTIMATED (2042)	ESTIMATED (2052)
97 815	118 845	144 473	175 578

With a population estimate of 118 845 people in 2032, it is evident that an additional 21 030 people will be generating waste. This population growth will ultimately increase the number of households within the Municipality requiring waste management services as projected in **Table 4-6** below.


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Table 4-6: Municipality's Number of Households Projections (Stats SA,2011/2022)

CENSUS 2011 STATISTICS:	CENSUS 2022 STATISTICS:	IN 10 YEARS HH INCREASED BY:
21 388	29 239	7 851
2032	2042	2052
(HH in 10 years)	(HH in 20 years)	(HH in 30 years)
35 525	43 186	52 484

Note: The baseline year used for estimates is 2022

4.4 Waste Management Systems


Existing waste management systems within the Municipality have been explored to determine the quantities and the types of waste generated in its area of jurisdiction. This involves establishing the current quantities of waste generated, recycled, treated, and disposed of to highlight the gaps and challenges within the Municipality.

4.4.1 Waste Generation and Characterisation

Waste generated in the Municipality can generally be categorised as follows:

- **General domestic and commercial waste:** This consists of paper, plastic, metal, glass, and building rubble.
- **Medical waste:** This includes infectious waste, pathological waste, sharp waste, pharmaceutical waste, chemical waste, waste with heavy metals, and radioactive waste.
- **Hazardous waste:** Includes waste such as motor oils, sewage sludge, and electronic waste; and
- **Organic waste-** This includes garden waste, fruits and vegetables.

Figure 4-5 below shows the main waste subgroups generated, thus constituting waste streams within the MLM.

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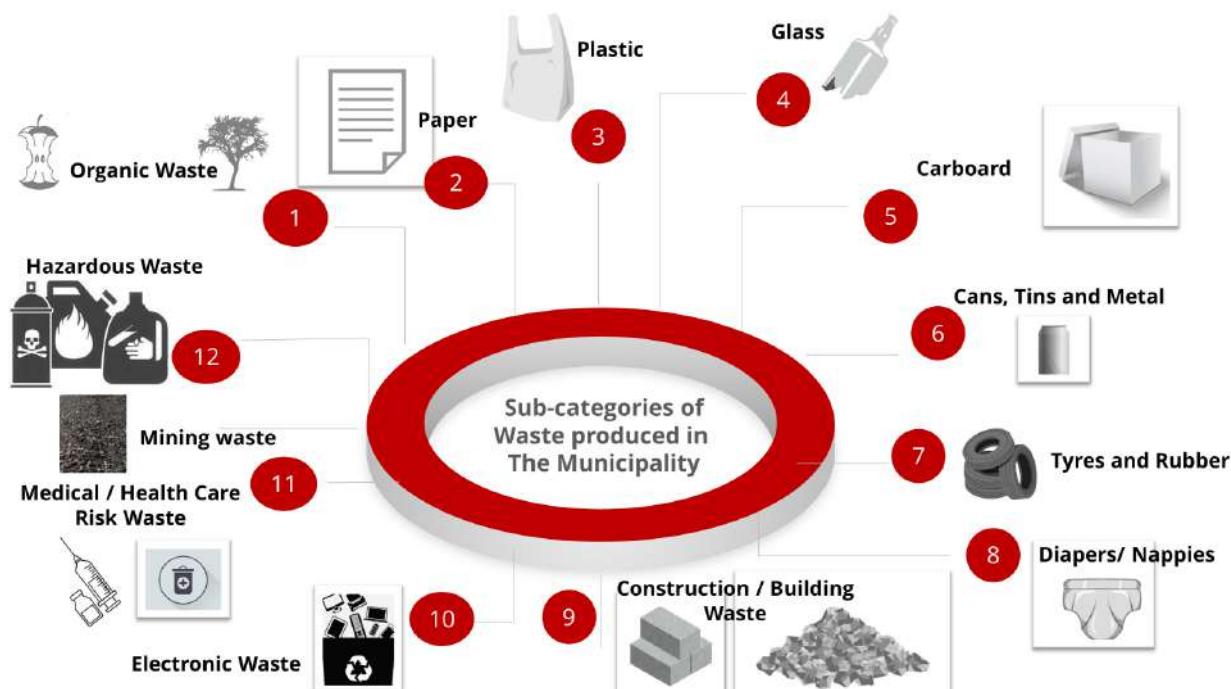



Figure 4-5: Sub-Categories of Waste Generated in MLM

4.4.1.1 Waste Stream Analysis

The waste characterisation was conducted on the 06th and 07th of February 2024 at three waste disposal facilities within the MLM. The waste characterisation was conducted towards the end of summer, waste characterisation must be conducted in all seasons to analyse the trend of the type of waste generated in each season, therefore, the municipality is encouraged to conduct waste characterisation in all seasons. Various waste streams were identified from the three waste disposal facilities visited in MLM. The various waste streams included High-Density Polyethylene (HDPE), Plastic, Polyethylene terephthalate (PET), polystyrene, clear plastic, mixed plastic, food waste, cardboard, aluminium cans, white paper, glass bottles, textiles, diapers and garden waste. The dominant waste generated at Grahamstown Disposal Facility was found to be diapers while the least is polystyrene, in Riebeeck East Disposal Facility glass was the most dominant from household waste while white paper was the least, however, the waste collected from the business area showed that cardboard was the most dominant while medical waste was the least generated. Waste characterised at the Alicedale Disposal Facility showed that the dominant waste generated is glass while the least generated is polystyrene.

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The general waste disposed at the Grahamstown Disposal Facility was collected from the following residential areas; Kingswood Area (high-income class) and Ghost Town (low-income class), Scotch Farm (low-income class), and Vergenoeg (low and middle-income class) was sampled and characterised on the 06th of February 2024. Samples were analysed from these areas to present the total waste streams within the municipality. This will indicate the potential recyclable waste materials that can be diverted from landfilling within the Municipality.



The following method was used to analyse/characterise waste streams:

- A minimum of 160.97 kg sample was taken from the Grahamstown disposal site, 113.99 kg from the Riebeeck East disposal site, and 173.45 kg from the Alicedale disposal site.
- The waste was then sorted into different waste streams and placed in refuse bags according to their waste stream; and
- The sorted waste streams were then weighed (kilograms) using a scale.

The waste stream is composed of fifteen (15) categories, namely, High-Density Polyethylene (HDPE), Plastic, Polyethylene terephthalate (PET), polystyrene, clear plastic, mixed plastic, food waste, cardboard, aluminium cans, white paper, glass bottles, textile, diapers, garden waste, and foil. **Table 4-7** and **Figure 4-6** below detail waste stream analysis from Kingswood Area, Ghost Town, Vergenoeg, and Scotch's Farm residential areas with a majority of waste being diapers at 18.72% and the least being polystyrene at 1.09% as shown on **Table 4-7**. Diapers are non-recyclable; therefore, everyone with a baby uses the disposal method to eliminate diaper waste from their households. A total of 80.03% is recyclable waste from the sample used for the waste characterisation analysis.

Table 4-7: Waste Streams Analysis from Kingswood Area, Ghost Town, Vergenoeg, and Scotch's Farm Residential

WASTE STREAM	MASS (KG)	ANNUAL MASS ESTIMATE (KG)	ANNUAL MASS ESTIMATE (TONS)	PERCENTAGE (%)
White Paper	6.00	2190.00	2.19	3.74
Aluminium cans	12.64	4613.60	4.61	7.87
PET	19.95	7281.75	7.28	12.42
Mixed waste	8.85	3230.25	3.23	5.51
Polystyrene	1.75	638.75	0.64	1.09
Clear plastic	4.00	1460.00	1.46	2.49

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Diapers	30.06	10971.90	10.97	18.72
LDPE	4.55	1660.75	1.66	2.83
Cardboard	20.82	7599.30	7.60	12.97
Glass bottles	14.00	5110.00	5.11	8.72
HDPE	8.60	3139.00	3.14	5.36
Mixed Plastic	8.85	3230.25	3.23	5.51
Garden Waste	12.50	4562.50	4.56	7.78
Food waste	6.00	2190.00	2.19	3.74
Textile	2.00	730.00	0.73	1.25
Total	160.57	58608.05	57.88	98.75

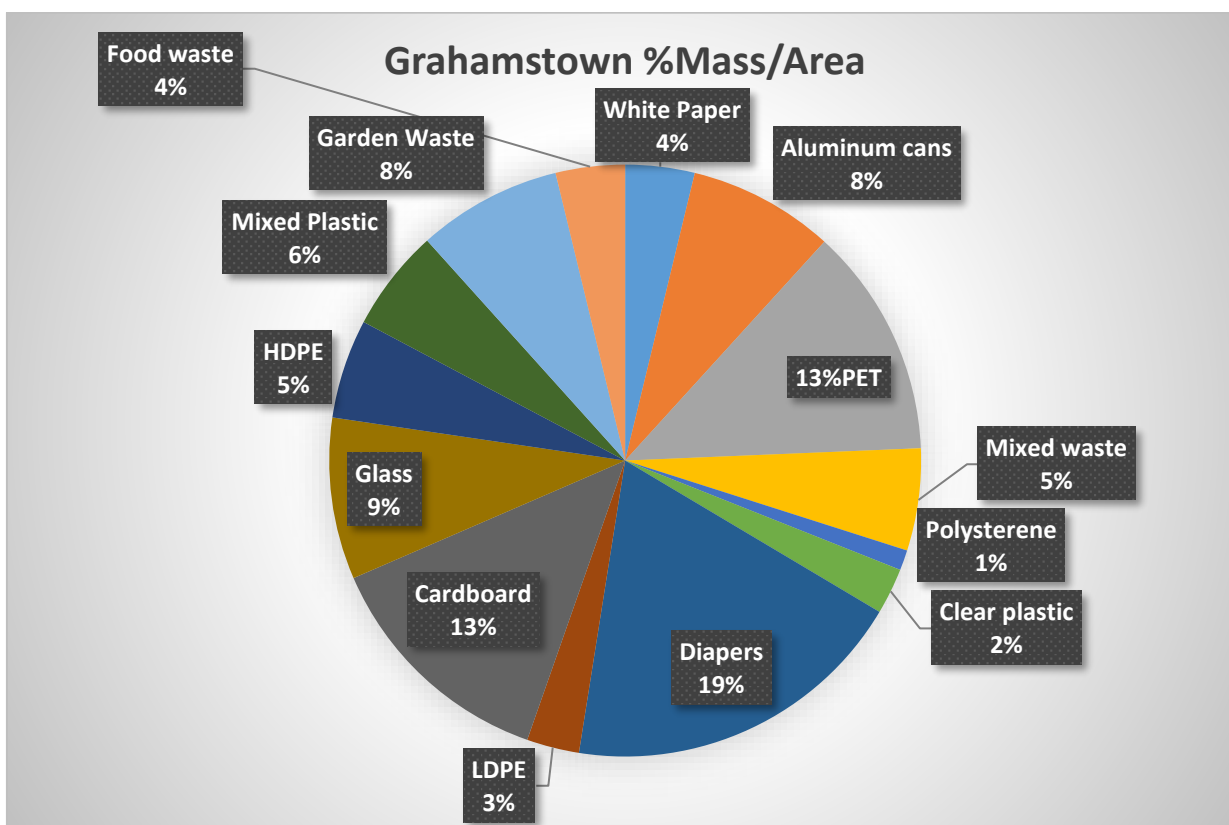




Figure 4-6 Waste Stream Analysis from Makhanda and surrounding Residentials

General waste disposed at the Riebeeck East Disposal Facility is from the surrounding households (low-income class) and business areas was sampled and characterised on the 07th of February 2024. Samples were analysed from the site to present the total waste streams within


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the municipality. This will indicate the potential recyclable waste materials that can be diverted from being landfilled within the Municipality. The same method was used to analyse/characterize waste streams. The waste stream is composed of ten (10) categories, namely, High-Density Polyethylene (HDPE), Polyethylene terephthalate (PET), polystyrene, mixed plastic, cardboard, Aluminium cans, white paper, glass bottles, LDPE, and organic waste. Glass represents the largest category at approximately 26.80%, highlighting the potential for increased recycling efforts in this waste stream. Notably, plastics account for 26.01%, while the least waste generated waste is white paper accounting for 1.14% of the total waste. A total of 100% of the waste weighed is recyclable as shown in **Table 4-7**.

Table 4-8 and **Figure 4-7** below detail waste stream analysis from Riebeek East residential areas.

Table 4-8: Waste Streams Analysis from Riebeek East Residential

WASTE STREAM	MASS (KG)	ANNUAL MASS ESTIMATE (KG)	ANNUAL MASS ESTIMATE (TONS)	PERCENTAGE (%)
White Paper	1.3	474.5	0.47	1.14
Polystyrene	4	1460	1.46	3.51
Glass bottles	30.55	11150.75	11.15	26.80
PET	15.05	5493.5	5.49	13.20
Mixed plastic	8	2920	2.92	7.02
Aluminium cans	8	2920	2.92	7.02
HDPE	6.21	2266.65	2.27	5.45
LDPE	7.23	2638.95	2.64	6.34
Food Waste	4	1460	1.46	3.51
Cardboard	29.65	1082.25	10.82	26.01
Total	113.99	41606.35	41.61	100

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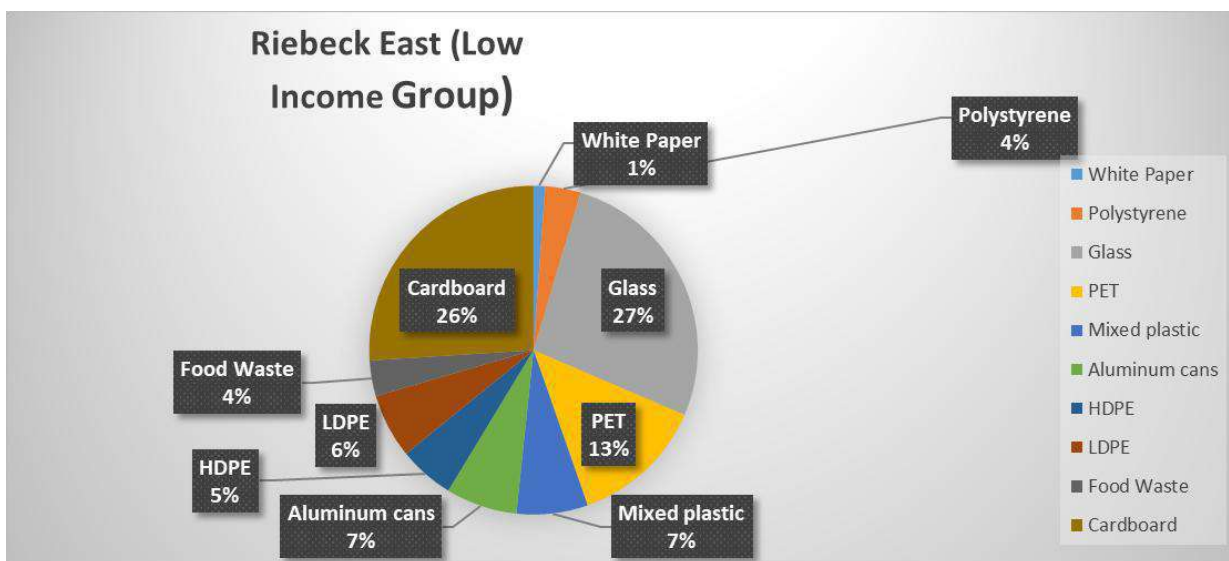


Figure 4-7: Waste Stream Analysis from Riebeek East Residential

Waste disposed at the Alicedale Disposal Site is from the surrounding households (low-income class) and business areas, the waste was sampled and characterised on the 07th of February 2024. Samples were analysed to give a presentation of the total waste streams within the Municipality. This will indicate the potential recyclable waste materials that can be diverted from the disposal facility within the Municipality. The same method was used to analyse/characterize waste streams for all disposal sites.

The waste stream is composed of thirteen (13) categories, namely, High-Density Polyethylene (HDPE), Polyethylene terephthalate (PET), polystyrene, plastic, cardboard, Low-Density Polyethylene (LDPE), Aluminium cans, white paper, glass bottles, textile, medical waste, sanitary waste, and food waste. **Tables 4-9, Table 4-10, Figures 4-8, and Figures 4-9** below detail waste stream analysis from Riebeek East residential and business areas with a majority of waste being cardboard from business areas and glass bottles from residential areas. From the waste collected from the business area, cardboard is the most generated waste accounting for 34.40% of the total waste while medical waste is the least generated accounting for 0.29%. The main business activities in town are retail and offices, therefore the cardboard waste generated is most likely generated from packages and deliveries from the retail shops. From the household waste sample analysed, the most generated waste is glass bottles accounting for 39.53% of the total waste while polystyrene is the least waste generated accounting for 0.9% as shown in **Table 4-9**. A total of 93.42% is recyclable waste.



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Table 4-9: Waste Streams Analysis from Alicedale Business Area

WASTE STREAM	MASS (KG)	ANNUAL MASS ESTIMATE (KG)	ANNUAL MASS ESTIMATE (TONS)	PERCENTAGE (%)
Textile	5	1825	1.825	7.20
Polystyrene	1,3	474.5	0.4745	1.87
Glass bottles	7	2555	2.555	10.08
Diapers	4.75	1733.75	1.73375	6.84
PET	5.95	2171.75	2.17175	8.57
Cardboard	23.9	8723.5	8.7235	34.40
Aluminium Cans	1.35	492.75	0.49275	1.94
Plastic	20.4	7446	7.446	29.37
Medical waste	0.2	73	0.073	0.29
Total	69.85	25495.25	25.50	100.55

Table 4-10: Waste Streams Analysis from Alicedale Residential Area

WASTE STREAM	MASS (KG)	ANNUAL MASS ESTIMATE (KG)	ANNUAL MASS ESTIMATE (TONS)	PERCENTAGE (%)
Polystyrene	1	365	0.365	0.97
PET	14.5	5292.5	5.29	14.00
Diapers	11.05	4033.25	4.03	10.67
White paper	2.15	784.75	0.78	2.08
HPDA	7.45	2719.25	2.72	7.19
Glass bottles	40.95	14946.75	14.95	39.53
LDPE	4.25	1551.25	1.55	4.10
Plastic	9.2	3358	3.36	8.88
Food Waste	2	730	0.73	1.93
Textile	11.05	4033.25	4.03	10.67
Total	103.6	37814	37.81	100.00

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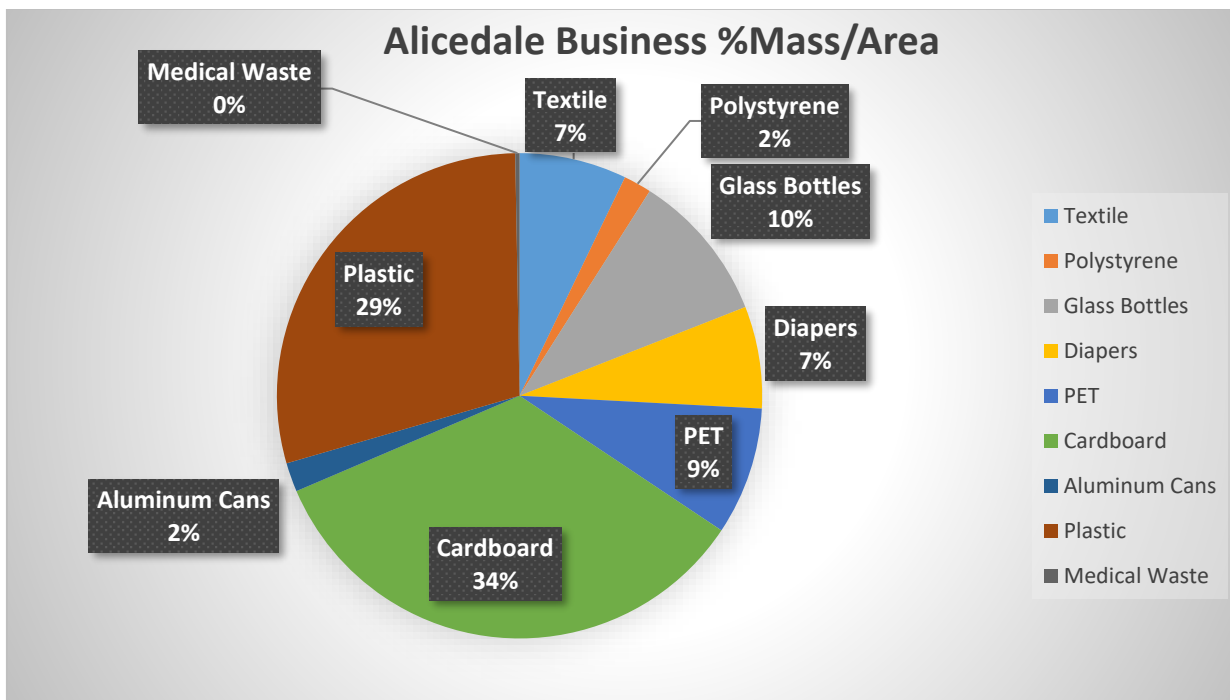


Figure 4-8 Waste Stream Analysis from Alicedale Business Area

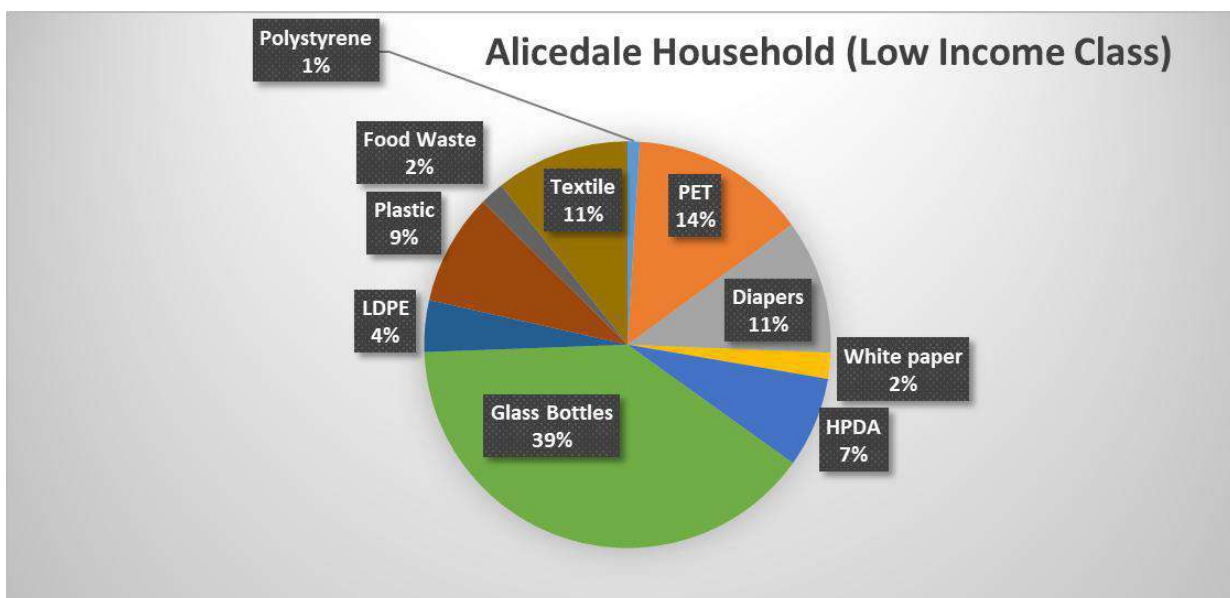



Figure 4-9: Waste Stream Analysis from Alicedale Residential

4.4.2 Waste Collection

The Municipality is responsible for the collection of waste from various areas five times a week (Monday to Friday). The waste collected is disposed of at the three disposal sites within the

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municipality, however, waste collection and disposal at Riebeek East and Alicedale areas only occurs on request and availability of waste. Waste disposed at the Grahamstown disposal site is collected daily from the different areas in and around town. The Municipality has 1,600 registered indigent households, and all receive free basic waste collection services. Household waste is collected five times a week in different areas within the Municipality. Domestic waste and/or commercial waste in some areas and businesses is collected by private companies, although the By-law is clear that waste should be collected by the municipality unless an agreement between the parties has been entered into for collection. The Municipality does not offer collection services to farms; therefore, farm owners are responsible for the disposal of their waste which can result in the burning of waste. The employed methods of waste within the municipality are kerbside and communal waste skips. The waste collection schedule in the different areas is summarised below in **Table 4-11**.

Table 4-11 Waste collection schedule within MLM

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
<ul style="list-style-type: none"> • Makhanda CBD • Fort England Area • George Street to P.J Olivier • Sunny Side Area • Transit Camp and Phaphamani Area 	<ul style="list-style-type: none"> • Albany Road • Kings Wood Area, • Fits Roy Area Seymour • Southy Area • Ghost Town • Vergenoeg • Scotch Farm • A-M Street and Vukani Location 	<ul style="list-style-type: none"> • Extension 2,3,4,5,6 and 8, • Zolani Eluxolweni • Lingelihle, and Ethembeni extension. 	<ul style="list-style-type: none"> • PA (Queen Street) • Fort England Area • Hill 60 • Wooster to Industrial Areas • Cradock Heights, • Somerset Heights • Army Base • Graeme College Area • Oatlands Area and Fits Roy and extension 9 	<ul style="list-style-type: none"> • Tanti Location • Xolani Location • Hoogenoeg, Extension 10 and Enkanini Extension.


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Table 4-12 below details basic waste collection services within the Municipality.

Table 4-12: Status of waste collection in MLM

MLM DATA		STATS SA 2022
Total Number of Households (Stats SA 2022)	29 239	29 239
Serviced Households	26 023	27 632
Un-serviced Households	3 216	1 607
Number of Indigent Households	1600	-
Serviced Indigent Households	1600	-
Un- Indigent Households	0	-

4.4.2.1 Waste Management Fleet

To achieve effective waste management collection, the Municipality must be equipped with a sufficient and efficient waste management fleet to carry out waste collection and waste disposal services. **Table 4-13** and **Figure 4-10** below detail the fleet that is currently available to render waste management services within the Municipality. There is a need for more waste management fleet within the Municipality to ensure sufficient and efficient waste management practices at all three disposal sites. The Municipality has plans to replace old fleets on a small scale, however, they currently do not have the budget and depend on donations. Currently, only five (5) fleets are being used for waste collection and disposal, however, all the fleets used are not designed for collection but due to the lack of resources and equipment, the Municipality uses these fleets to ensure that waste collection occurs. Due to the lack of resources within the Municipality, they are unable to assign fleets to assist with clearing illegal dumping hotspots. The available fleets are used for waste collection and disposal which is scheduled from Monday-Friday every week.


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Table 4-13: Waste Management Fleet in MLM

DIFFERENT VEHICLES AVAILABLE FOR WASTE MANAGEMENT	DESCRIPTION	MODEL	CONDITION OF VEHICLE	AVERAGE BREAKDOWNS PER MONTH (DAYS PER MONTH)
Compactor Truck	Isuzu FTR 850	2012	Bad condition	Two
Compactor Truck	Isuzu FTR 850	2012	Clutch problem (not working)	Two
Compactor Truck	Isuzu FTR 800	2007	Engin pipes are broken (not working)	Two
1x Rollon Container	Isuzu	2013	Out of commission	Out of commission
2x Tipper Truck	Isuzu	2023 & 2003	Working	Two
1x Steel Cage Truck	Nissan	2022	Working	Two
1x Front and Loader	Komatsu/Bell	2009	Working, however, it is in bad condition	Three
1x Skipper Truck	Mercedes	2022	Working	One
1x CM 10 Truck	414 Isuzu	2011	Clutch problem (not currently working)	Three
1x Bakkie	T21 Bakkie	2011	Working	One



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Figure 4-10 MLM waste management fleet

4.4.3 Waste Recycling, Treatment and Disposal

4.4.3.1 Status of Waste Disposal Facilities

Waste disposal includes several waste disposal facilities and their status. The Municipality has three operational waste disposal facilities namely Grahamstown, Riebeek East, and Alicedale waste disposal facilities. The Municipality is responsible for the management of Riebeek East and Alicedale disposal sites and has appointed Mphela Engineers (Service Provider) to assist in the management of the Grahamstown waste disposal site. **Table 4-14** details the status of MLM waste disposal facilities. There is a need for more waste management fleet within the Municipality to ensure sufficient and efficient waste management practices such as compaction at all three disposal sites.




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Table 4-14: Status of MLM Waste Disposal Facilities

DETAILS OF MLM DISPOSAL FACILITIES	GRAHAMSTOWN DISPOSAL FACILITY	RIEBEEK EAST DISPOSAL FACILITY	ALICEDALE DISPOSAL FACILITY
Position of site:	Located approximately 2km from town at co-ordinates:33°17'29.57" S 26° 29'33.88" E	Located approximately 2km from town at co-ordinates:33°12' 35.79" S 26° 10'58.82" E	Located approximately 500m from town at co-ordinates: 33° 19' 3.88" S 26°4'35.69" E
Permit/License:	B33/2/1400/3P243	Unknown	Unknown
Year issued:	10 September 1996	2005	2005
Classification of the site:	G:M: B+	Unknown	Unknown
Type of Operation (end-tip, trench, cell):	End tip method	No proper method is followed, and waste is burned	No proper method is followed, and waste is burned
Estimated size of site:	Approximately 10ha	Approximately 0.5ha	Approximately 0.9ha
Estimated remaining life of site:	17 Months	Unknown	Unknown
Separation of fresh and contaminated water:	Yes, controlled at the leachate pond	No	No
Groundwater monitoring:	6 monthly monitoring of downstream borehole at the neighbouring farmer	Not required	There is no close by known borehole
Volumes per day, week, or month:	6 113.33 tons per month	Unknown	Unknown
Is cover material available?	No	No	No
Is the drainage sufficient?	Yes	No	No
Is there access control?	Yes	No	No
Is the site fenced?	Yes, however, there is a need to fix the broken areas (maintenance)	Yes, however, there is a need to fix the broken areas (maintenance)	Yes, however, there is a need to fix the broken areas (maintenance)
Does the site have a sufficient buffer zone?	Yes (2 Km)	Yes (2 Km)	Yes (500m)
Type of equipment utilised on site:	1 x D6 Dozer 1 x 10m3 Tipper Truck	None	None

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	1 x TLB 4x4 Case 1 x Skid Steer (4 Ton) 1 x 1 Ton LDV Nissan NP300 1 x Fire Fighting Nissan Cab star		
Operating hours:	07h00-18h00 daily	There are no official operating hours	There are no official operating hours
Site facilities, i.e. ablutions, guard house:	Guardhouse	None	None
Weighbridge	1x Non-operational	None	None
Estimating cost for closure:	R38 519 192	Unknown	Unknown
Savings plan for closure	No estimate regarding closure exists. The municipality must budget for the closure and rehabilitation timeously.	No estimate regarding closure exists. The municipality must budget for the closure and rehabilitation timeously	No estimate regarding closure exists. The municipality must budget for the closure and rehabilitation timeously.

4.4.3.1.1 Waste Management Challenges in Disposal Facilities


Based on observations and interviews conducted during ground truthing, the following challenges were noted at the disposal facilities:

Grahamstown Waste Disposal Facility

- There is no waste compaction;
- No ablution facilities (toilets), especially for Grahamstown where there is staff on site;
- No cover material;
- Limited Air Space;
- No weighbridge;
- There is no record of incoming waste;
- Waste is not separated or sorted;
- Broken fences;

Riebeeck East Waste Disposal Facility

- No security guards or lockable gate;
- There is no waste compaction;
- No ablution facilities (toilet, store/staff room, and water supply);

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- No cover material;
- There are no waste pickers/reclaimers;
- Limited Air Space;
- No weighbridge;
- There is no record of incoming waste;
- Waste is not separated or sorted;
- Broken fences;
- There is evidence of burnt waste as seen in Figure 4-9;
- No notification board at the entrance of the disposal facilities;
- There is no equipment to utilise at the disposal facility.

Alicedale Disposal Facility

- No security guards or lockable gate;
- There is no waste compaction;
- No ablution facilities (toilet, store/staff room, and water supply);
- No cover material;
- There are no waste pickers/reclaimers;
- Limited Air Space;
- No weighbridge;
- There is no record of incoming waste;
- Waste is not separated or sorted;
- Broken fences;
- Burning of waste on site;
- No notification board at the entrance of the disposal facilities;
- There is no equipment to utilise at the disposal facility.

Figure 4-11, Figure 4-12 and Figure 4-13 depicts the status of MLM waste disposal facilities.

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Figure 4-11: Status of Grahamstown Waste Disposal Facility

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Figure 4-12 Status of Riebeek East Waste Disposal Facility



Figure 4-13 Status of Alicedale Waste Disposal Facility

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4.4.3.1.2 Illegal Dumping

Illegal dumping is one of the problems facing the Municipality. Illegal dumping hotspots have been identified within MLM residential areas and by law, it is a punishable offence to dump waste in an area that is not designated for waste disposal, however, the Kagiso Trust has been working with the municipality to identify illegal dumping hotspots to redevelop these areas. The Kagiso Trust has clean-up campaigns that aim to clean up the identified hotspots and redevelop the area. To date, the Kagiso Trust has identified fourteen (14) illegal dumping hotspots wherein they will assist the municipality to retreat the areas. The Municipality has more illegal dumping hotspots, however, Kagiso Trust has identified fourteen (14) illegal hotspots that are to be redeveloped and cleared. There are five (5) critical illegal dumping hotspots that the Municipality has been legally ordered to clear regularly by the court, these include Emrhwetyana Joza, Kwakhaya (at the back of Ext10), Ezinjeni Ext 6, Ezihagwini Ext 6 and Terminus Ext7. The municipality relies on the contracted service provider to assist with clearing illegal dumps (randomly). The Municipality does not conduct environmental awareness or run any waste campaigns that can assist in reducing the number of hotspots within the Municipality. The lack of environmental awareness which can assist in minimizing illegal hotspots is due to inadequate staff and unavailability of funds. To further support the work being undertaken by the trust and sometimes the service provider, the Municipality needs to frequently clean up illegal dumps, raise community awareness, and enforce penalties under their waste management policies.

Figure 4-14 shows some of the illegal dump sites within the municipality.



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Figure 4-14: Illegal dumps

4.4.3.1.3 Hazardous and Health Care Risk Care Waste Disposal

The responsibility of managing hazardous waste and HCRW waste does not lie with municipalities, however, the Municipality needs to know whether the waste within its jurisdiction is managed properly. The Eastern Cape Department of Health (ECDOH) is responsible for the management of HCRW generated in government hospitals and clinics. ECDOH has appointed Compass Waste which operates an HCRW treatment facility near Berlin in East London to manage HCRW from government clinics and hospitals.

Hazardous waste such as used oil from mechanics is not allowed at the waste disposal facility, waste generators are responsible for managing their hazardous waste. The Municipality must make provision for the management of hazardous waste generated by residents within the municipal jurisdiction as co-disposal on operational non-engineered waste disposal facilities is prohibited. This can be achieved by engaging with PROs to establish a working relationship for the effective implementation of EPR.

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4.4.3.2 Waste Treatment Facilities

There are no waste treatment facilities within MLM.

4.4.3.3 Status of Waste Recycling



Recycling is a key component of waste minimisation which is practiced within the Municipality by private companies. However, the Municipality has launched a pilot for clear and black bags system with the intention of promoting waste separation at source. This aim of this initiative is to enhance and promote recycling within the Municipality.

One of the private companies providing recycling solutions is GHT Recycling which is situated a few metres away from the Grahamstown disposal facility. GHT collects recyclables such as cardboard, paper, and plastic. There are informal/unregistered reclaimers sorting and collecting recyclables at the Grahamstown disposal facility and selling the recyclables to recycling entrepreneurs. It was mentioned during interviews at the Grahamstown waste disposal facility on the 06th of February 2024 that a good working relationship between the recyclers and the drivers would assist the recycling companies if trucks with separated recyclables could be disposed of separately to allow recyclers to recover recyclable materials before they are contaminated or mixed. Some of the waste collected by these reclaimers is sold to GHT Recyclers. During the site visit, huge volumes of recyclable materials were observed at the recycling facility. Metal Master is a recycling company that deals with metals and scrap, it is located close to the Grahamstown disposal facility. Both recycling companies are located at Strowan Road, Grahamstown, Industrial Area few metres away from the Grahamstown waste disposal facility. In addition to the identified recycling companies within the municipality, Rhodes University supports the municipality with recycling awareness. Furthermore, the Municipality should partner and work with registered PROs for infrastructure and waste collection incentives.

Table 4-15 below highlight recycling initiatives within MLM, their registration status, and the type of recyclable materials being recycled.

Table 4-15: Waste Recycling Status

RECYCLING COMPANIES	REGISTRATION STATUS	OPERATIONS STATUS	RECYCLABLE MATERIALS
GHT Recycling	Registered	Operational	Plastic, Paper, Cardboard
Metal Master	Unknown	Operational	Scrap Metal

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4.4.4 Waste Composting

There are no composting facilities within the Municipality. Diversion of organic waste from landfill sites can save landfill site airspace and allow waste beneficiation from the sale of compost. The Municipality must develop and implement a waste diversion plan to reduce the disposal volumes and combat the illegal dumping of garden waste on the outskirts. Garden waste is currently disposed at all the waste disposal facilities within the MLM, nevertheless; the Municipality does not record and report on waste disposal or diversion. Disposal of garden waste is prohibited at waste disposal facilities, as such the Municipality must implement an organic waste diversion strategy.

4.4.5 Waste Reporting

General waste disposal facilities that receive more than 150 tons of waste per day, and recycling and treatment facilities are required to register and report on the SAWIS. These facilities are required to report monthly, and annual tonnages of waste generated, recycled, and disposed of at the waste disposal facility. All three waste disposal facilities within MLM do not have a weighbridge, and therefore there are no waste volumes recorded or reported on SAWIS. Reporting on SAWIS is a legislative requirement that should be adhered to by the municipality.

4.4.6 Determining current domestic waste generation per capita

The DFFE IWMP Guidelines suggest various techniques that can be adopted for estimating waste generation rates and characteristics. These include:

- Modelling techniques – generally an inexpensive technique based on generic data but only provides a general idea of the waste volumes and types.
- Physical sampling techniques – A more accurate method but a more time-consuming and expensive exercise; and
- Direct measurement techniques – even more costly than physical sampling.

For the MLM's IWMP, a model approach was adopted to estimate waste generation for all income categories. The South African State of Environment Report (SA SoER, 2018) estimated that each person generates about 0.7 kg of waste each day. This is further broken down according to income category as follows:

- Low income=0.41kg/person/day or (0.41kgx365 days) =149.65kg/person/year
- Middle income=0.74kg/person/day or (0.74kgx 365days) = 270.1kg/person/year

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- High income=1.29 kg/person/day or (1.29kgx365days) = 470.85kg/person/year

The referenced waste generation averages for different income levels were applied to income categories sourced from Stats SA 2022 data. **Figure 4-14** shows MLM-specific demographic information used to calculate future waste generation is presented in **Table 4-14** for the Municipality.

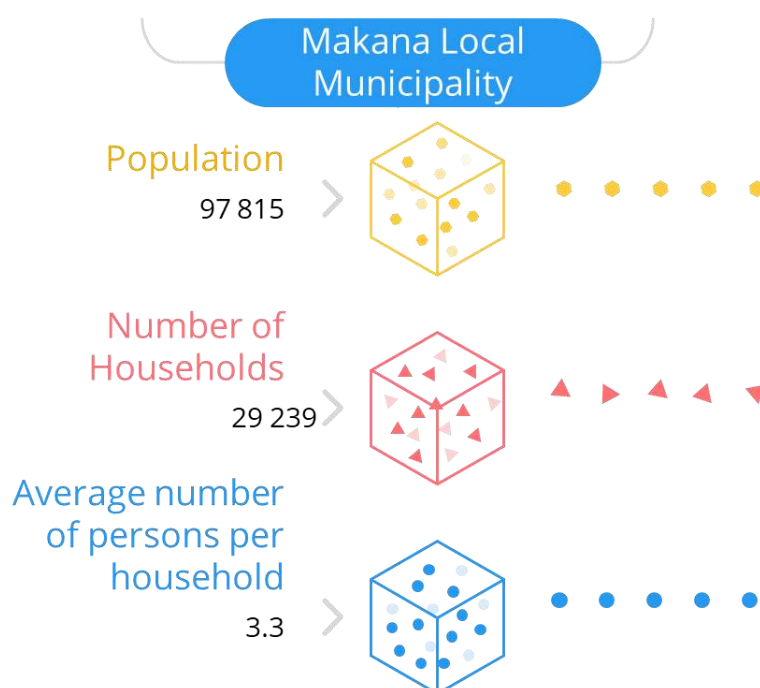


Figure 4-15: Demographics for MLM (Stats SA, 2022)

Stats SA, 2022 doesn't average household income statistics, as a result, Stats SA 2011 averages were used with the assumption that all income groups grew at the same rate. **Table 4-16** below summarises waste generation for MLM. Based on the analysis in **Table 4-16** below, it is estimated that the domestic waste per year for MLM is about **17 773.76 tons**.



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Table 4-16: Yearly Estimated Waste Quantities for MLM (Stats SA, 2011/2022)

MONTHLY HOUSEHOLD INCOME		%	PEOPLE	HOUSEHOLDS	ALL PERSONS BY INCOME GROUP	INCOME GROUP	SA SOER (KG/CAPITA/DAY)	CURRENT DOMESTIC WASTE GENERATION PER CAPITA (KG/PERSON/YEAR)	TONNES/ PERSON/ YEAR
(RANDS)									
No income		12.7	12423	3764	75318	LOW	149.65	11271271.36	11271.27
1.00	4 800	4.2	4108	1245					
4801.00	9600.00	5.9	5771	1749					
9601.00	19600.00	19.5	19074	5780					
19601.00	38200.00	20.5	20052	6076					
38201.00	76400.00	14.2	13890	4209					
76401.00	153800.00	10.2	9977	3023	20835	MIDDLE	270.10	5627424.11	5627.42
153801.00	307600.00	7.0	6847	2075					
307601.00	614400.00	4.1	4010	1215					
614001.00	1228800.00	1.2	1174	356	1858	HIGHER	470.85	875067.66	875.07
1228801.00	2457600.00	0.4	391	119					
2457601.00		0.3	293	89					
						Total kg's/person/year		17773763.13	17 773.76
						Total tonnes/person/year		17 773.76	

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4.4.7 Estimating Future Waste Generation Rates and Quantities

Estimating future waste trends using information collected on the domestic waste generation rates for each socio-economic category/type i.e. the population, population distribution, and commercial. With a growth rate of 1.97% (Stats SA, 2022) per year, the population is expected to increase over the next five (5) years. It is envisaged that the most probable driver of waste generation will be future developments and the change in the socio-economic profile of MLM's population. The main change to the profile of waste collection in the Municipality will be the expansion of the urban centres because of rural-to-urban migration and the development of these urban areas. This could manifest itself in the following manner:

- Business development across the Municipality.
- Urbanisation; and
- Agricultural activities.

Estimations of future waste generation in MLM for the next 10, 20, and 30 years are presented in **Table 4-17**, **Table 4-18**, and **Table 4-19**.

Table 4-17: Estimation of Future Waste Volumes (in 10 Years/2032) Produced per Capita in MLM

TYPE OF SETTLEMENT	BASE POPULATION (2022)	FUTURE POPULATION ESTIMATES	DOMESTIC WASTE GENERATION RATES (KG) PER CAPITA	FUTURE DOMESTIC WASTE GENERATION RATES PER CAPITA (TONS) (BASE POPULATION *KG'S/PERSON/YEAR/1000)
Low Income	75 318	91 511	0,49	13 694.59
Middle Income	20 835	25 314	0,74	6 837.32
High Income	1 858	2 258	1,29	1 063.21



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Table 4-18: Estimation of future waste volumes (in 20 years/2042) produced per capita in MLM


TYPE OF SETTLEMENT	BASE POPULATION (2022)	FUTURE POPULATION ESTIMATES	DOMESTIC WASTE GENERATION RATES (KG) PER CAPITA	FUTURE DOMESTIC WASTE GENERATION RATES PER CAPITA (TONS) (BASE POPULATION *KG'S/PERSON/YEAR/1000)
Low Income	75 318	111 244	0,49	16 647.67
Middle Income	20 835	30 773	0,74	8 311.71
High Income	1 858	2 745	1,29	1 292.47

Table 4-19: Estimation of future waste volumes (in 30 years/2052) produced per capita in MLM

TYPE OF SETTLEMENT	BASE POPULATION (2022)	FUTURE POPULATION ESTIMATES	DOMESTIC WASTE GENERATION RATES (KG) PER CAPITA	FUTURE DOMESTIC WASTE GENERATION RATES PER CAPITA (TONS) (BASE POPULATION *KG'S/PERSON/YEAR/1000)
Low Income	75 318	135 195	0,49	20 231.93
Middle Income	20 285	37 398	0,74	10 101.23
High Income	1 858	3 336	1,29	1 570.47

Table 4-17, Table 4-18, and Table 4-19 above are on future waste volumes based on the following assumptions:

- Assuming that the population growth rates will remain constant for the next 30 years.
- Assuming that the per capita waste generation rates would be according to the 2018 State of the Environment Report for all income categories:
 - ✓ Low income=0.41kg/person/day
 - ✓ Middle income=0.74kg/person/day
 - ✓ High income=1.29 kg/person/day

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- Assuming that the waste generation rates would be according to the 2018 State of Environment figures in 30 years' time.

4.4.8 Financing of Waste Management

4.4.8.1 Budgeting for Waste Services

According to the Municipal Systems Act, Act No 32 of 2000, municipalities must ensure adequate budgeting to fulfil their constitutional mandate of providing waste management services. It is important to note that the Municipality has no budget for environmental awareness or campaigns. **Table 4-20** details categories of waste management cost drivers within MLM. From the data displayed in **Table 4-20**, the Municipality received a waste management budget of R1 719 000 in 2022/23 while the expenditure was approximately R15 569 000.00. From the difference between the waste management budget and expenditure, it can be concluded that the budget allocated for waste management services is insufficient. However, the budget allocated for waste management has increased from R535 000.00 in 2020/21 to R1 719 000.00 in 2022/23. MLM generates revenue through providing waste management services within the municipality. The waste management revenue for MLM in 2022/23 was R31 253 000 which was higher than the expenditure costs. Since the revenue generated by the Municipality was higher than the actual expenditure for waste management, it can be concluded that the Municipality operated in surplus.



Table 4-20: Annual Waste Management Budgeting

WASTE MANAGEMENT FINANCING	2020/21	2021/22	2022/23
Waste Management Capital Budget	R 535 000	R 100,000	R 1,719,000
Waste Management Expenditure	R 14,043,000	R 15,177,000	R 15,569,000
Waste Management Revenue	R 30,616,000	R 32,365,000	R 31,253,000
REVENUE SOURCES			
Equitable share funding	R 12,616,000	R12,925,000	R 17,851,000
Service Charges: Waste Management	R 18,000,000	R19,440,000	R13,402 ,000

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4.4.9 Organisational and Institutional Matters

This section details the current organizational structure and institutional matters to determine the available human resources to deliver waste services within the Municipality. **Figure 4-15** shows the current organizational structure.

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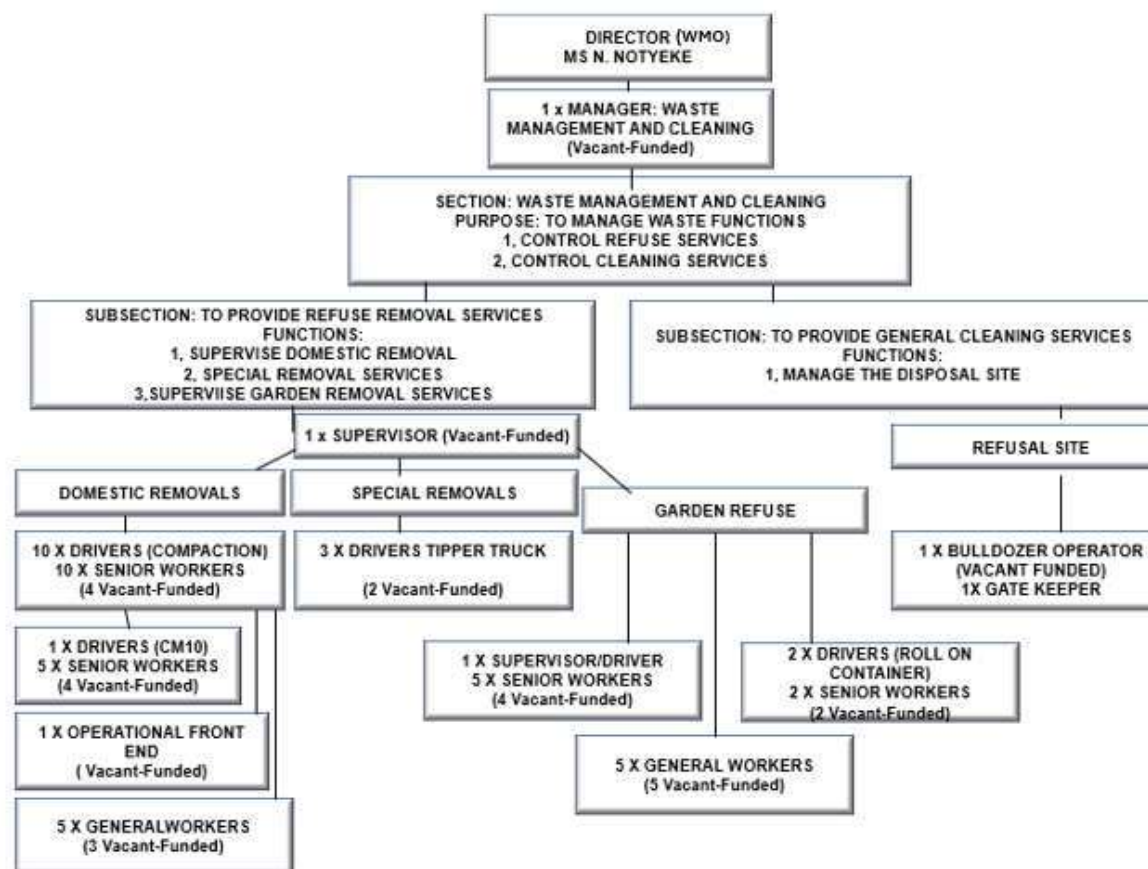


Figure 4-16: Waste Management Division Organisational Structure

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Based on the current organisational structure there are fifty-five (55) waste management officials which include drivers, senior workers, and general workers. MLM has appointed a designated WMO to assist the municipality with waste management practices and services. There is a total of thirty-two (32) funded vacancies, inclusive of managers, general workers, senior workers, and drivers. To ensure continued service and effective skills transfer and to also ensure that the correct functions are put in place to fulfil NEM: WAA's requirements, the successful implementation of IWMP, is dependent on the availability of qualified personnel. Continuous training and succession planning are crucial to maintaining a competent pool of employees. **Table 4-21** details the current institutional matters within MLM.

Table 4-21: Organisational and Institutional Matters

DEPARTMENT RESPONSIBLE FOR WASTE MANAGEMENT	BY-LAWS STATUS/WASTE POLICY	WASTE TARIFFS	PRIVATE SECTOR INVOLVEMENT IN WASTE MANAGEMENT	DESIGNATION OF (WMO)	EMIS
Community Services	The waste management By-Laws are currently under review.	Yes	Mphela Engineers (Service Provider) Recycling	One (1)	Two (2)

4.4.9.1 Designation of WMO

In terms of Section 10(1-3) of NEMWA, any organ of state that is authorised to carry out waste management services must designate in writing a WMO to coordinate waste management at each level of government, this is to ensure that there is a dedicated authority in each sphere of government that is responsible for implementing the policy and regulations of the NEMWA.

The duties and responsibilities that NEMWA and the NWMS assign to each sphere of government define the roles and powers of their WMOs. MLM has a designated WMO. It is important that the designated WMO performs regulatory functions and should be allocated functional divisions separate from service-delivery functions where possible. Guidelines for designating WMOs detail the roles and responsibilities of WMOs.

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Roles and responsibilities of Municipal WMO

- Policy development and bylaws
- Financial planning and management
- Integrated waste management planning and reporting
- Infrastructure development
- Waste services provision arrangements
- Performance management and regulatory capacity
- Health and hygiene promotion
- Asset management and legal matters
- Service authority structural and organisational issues (capacity building)



4.4.9.2 Development and Enforcement of By-Laws

MLM has developed waste management By-laws which are currently under review. Waste management By-Laws are crucial for maintaining a clean, healthy environment and ensuring responsible waste handling within the Municipality. They promote sustainable practices that protect both people and the environment. MLM currently has two trained and designated EMLs. The Municipality may enforce these By-Laws either through local or regional authorities through designated EMLs. To increase capacity to enforce municipal by-laws; municipalities can explore training Metro police/ local enforcement agencies on waste-related matters so that they too are equipped and can issue fines on waste management transgressions. EHPs could also be trained on waste matters to administer the enforcement of waste by-laws.

4.4.10 Mainstreaming Key Principles of the National Waste Management Strategy

4.4.10.1 Waste Minimisation and Prevention

This section focuses on the identification of existing waste minimization and prevention initiatives. The most preferred methods of waste management, as indicated by the waste hierarchy, are waste minimization and prevention. These waste management methods are important as they lower waste management expenses. The identification of current waste minimization and prevention measures will assist the Municipality in promoting waste minimization and prevention activities through advocacy and education to ensure that residents participate as much as possible as well as exploring opportunities for expanding the initiatives throughout the Municipality. Currently, there are no waste minimization and prevention initiatives. The Municipality should consider implementing waste minimisation initiatives such

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as a separation-at-source programme; recycling initiatives in collaboration with schools and communities, industrial symbiosis, etc.

4.4.10.2 Environmentally Sound Socio-Economic Growth and Development

This section focuses on identifying existing efforts to ensure environmentally sound socio-economic growth and development, this includes identifying waste management jobs in the Municipality, and efforts to support locally owned small businesses and entrepreneurs such as cooperatives and waste pickers. This information will help identify gaps in areas where there are new functions that must be performed. MLM has waste pickers reclaiming the recyclable materials from the Grahamstown waste disposal facility and these recyclable materials are sold to entrepreneurs involved in recycling. There are recycling facilities in proximity to the Grahamstown disposal facility where individuals from within the municipality are employed to assist with the recycling processes.

4.4.11 Waste Pickers Integration

There are approximately 100 waste pickers registered with Mphela Engineers (service provider) working within the Grahamstown waste disposal facility. The waste pickers collect recyclables and sell them to formal recycling establishments. During the site visit, most waste pickers were not wearing Personal Protective (PPE) clothing. Challenges that are faced by Mphela Engineers and the Municipality while working with waste pickers include a lack of identification (no identity document), a lack of consistency from the waste pickers, disappearing with resources supplied to them by the service provider and vandalizing the disposal site (e.g. stealing of fence). According to the municipality, there hasn't been progress on initiatives that support the livelihoods of the waste pickers.

There are currently no waste pickers at Riebeek East and Alicedale waste disposal facilities. Recycling facilities are located in Makhanda, and areas such as Alicedale and Riebeek East are situated further away from these facilities which limits recycling opportunities. The lack of recycling facilities and buy-back centres within the Riebeek East and Alicedale areas results in the burning of recyclable waste at the disposal sites. The Municipality currently does not have any active initiatives that encourage waste pickers to engage in recycling within these areas.

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4.4.12 Circular Economy

Incorporating a circular waste economy in the municipal planning process is crucial for implementing NWMS 2020. This section focuses on identifying the existing circular economy activities undertaken in the Municipality. This includes activities such as promoting behavioral change through education and awareness, implementing Extended Producer Responsibility (EPR), increasing the collection of material for recycling, and engaging in Industrial Symbiosis (IS) initiatives. Industrial Symbiosis is an initiative that involves the trade of waste within industries implemented by the DFFE. The municipality has no permanent staff to conduct awareness programs, they use EPWP participants every year to conduct such programs. The EPWP was under the DFFE for a year and the program ended on the 31 of March 2024. In the 2023 financial year field workers and one (1) supervisor was employed on a contract basis until 31 March 2024 to assist the municipality. Although the Municipality has no funds reserved for environmental awareness, they receive support from the Rhodes University and the DFFE for awareness initiatives.

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5 GAP AND NEEDS ANALYSIS

The gap and needs analysis aim to identify gaps, needs, and opportunities arising from the current waste management practices within MLM. Identifying the waste management priorities and goals that MLM wants to achieve includes the following:

- Identifying key waste management gaps;
- Developing strategic goals for the Integrated Waste Management Plan (IWMP);
- Developing an implementation plan; and
- Identifying the different alternatives that can be employed to achieve the desired end state should indicate the different approaches to achieve the targets.

Gaps and needs related to waste management in the MLM have been identified in terms of each of the following waste management activities:

- Solid waste service delivery;
- Waste management facilities;
- Waste management collection fleet, plant and equipment;
- Waste management information and reporting;
- Waste education and public awareness;
- Waste minimisation, recycling, and re-use initiatives;
- Organic waste management;
- Hazardous waste management;
- Human and financial resource management; and
- Strategic planning.

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5.1 Solid Waste Service Delivery

Table 5-1 provides the gaps identified as well as the resulting needs for waste service delivery in the MLM.

Table 5-1: Waste service delivery gaps and needs identified

GAP IDENTIFIED	RESULTING NEED/RECOMMENDATION
Waste collection method	Kerbside and communal skip collection is offered within the Municipality. MLM should consider collection methods such as transfer stations, and drop-off facilities which will potentially reduce illegal dumping and burning of waste.
Illegal dumping	Illegal dumping is a challenge across the Municipality. The municipality has inadequate staff to assist in cleaning up illegal dumping hotspots that have been identified. The Kagiso Trust has been working with the Municipality to identify some illegal dumping sites with plans to retreat them. Thus far, Kagiso Trust has identified fourteen (14) illegal sites. To improve the current state of illegal dumping sites, the Municipality should do the following; <ul style="list-style-type: none"> I. Introduce waste drop-off facilities to minimise illegal waste dumps. II. Map out illegal dumping hotspots and introduce frequent clean-up campaigns as well as littering awareness in those areas.
Number of un-serviced households in the MLM	The number of households increased from 21 388 in 2011 to 29 239 in 2022. The number of households increased by 7 851 in 10 years. The Municipality is collecting waste from 26 023 households, excluding 1600 indigent households which are also serviced by the municipality. The Municipality must aim to service all households in the Municipality, currently, the number of un-serviced households is 3 216. Therefore, the Municipality should expand service delivery to these households.



5.2 Waste Management Facilities

Table 5-2 provides the gaps identified in terms of waste management facilities within the MLM.

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Table 5-2: Waste management facilities gaps and needs identified

GAP IDENTIFIED	RESULTING NEED/RECOMMENDATION
Limited Recycling at MLM	There are only two active recycling companies at MLM, which were identified. One deals with recyclables such as cardboard and paper while the other facility deals with metals. Recycling only occurs in and surrounding Makhanda (Grahamstown) areas, while no recycling occurs around Riebeeck East and Alicedale. Recyclable materials were noted in Riebeeck East and Alicedale Waste Disposal Facilities. Transfer stations and drop-off facilities should be introduced to promote recycling within these areas. The Municipality should consider partnering with PROs through the EPR to assist with funds for recycling programmes for products under the EPR Schemes.
Broken fence (All Disposal Facilities)	The broken fence in all three disposal facilities should be fixed and maintained regularly.
Broken gate at Riebeeck East and Alicedale Disposal Facilities	The Municipality must upgrade and install functional gates at Riebeeck East and Alicedale Waste Disposal Facilities.
Lack of groundwater and surface water monitoring	There is no borehole near the Riebeeck East and Alicedale Waste Disposal Facilities, therefore, there is no groundwater monitoring conducted. A groundwater and surface water monitoring network must be set up to monitor groundwater and surface water accurately and regularly.
Lack of site facilities	Ablution facilities must be installed at the waste disposal facilities, Grahamstown waste disposal facility should be prioritized as there are staff and waste pickers on site.
Lack of weighbridges	Weighbridges must be provided at all Waste Disposal Facilities so that waste can be easily quantified and recorded.
Lack of waste volume tracking	All waste volume disposed at the waste disposal facilities must be logged in a waste register. As there is no weighbridge, this can be done manually using the estimated weight of the disposing vehicles.

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GAP IDENTIFIED	RESULTING NEED/RECOMMENDATION
Lack of waste pickers	The MLM must increase the number of waste pickers in the Grahamstown disposal facility. The Municipality must ensure that they register waste pickers at Riebeek East and Alicedale waste disposal facilities. The MLM must be able to identify the waste pickers to offer them support. The waste pickers must be equipped with the necessary Personal Protection Equipment (PPE).
Lack of internal and external auditing	Internal and external auditing must be done as per the relevant conditions in the respective WMLs.
No cover material	Cover material must be sourced internally or externally for regular covering and compaction at all three waste disposal facilities.
Lack of equipment at the Riebeek East and Alicedale Waste Disposal Facilities	The Municipality must procure equipment to assist in the management of the two waste disposal facilities e.g. compaction trucks.
Lack of drop-off facilities	The MLM must develop more drop-off facilities and make the public aware of these to prevent illegal dumping.

5.3 Waste Management Collection Fleet and Equipment

Table 5-3 provides the gaps identified in terms of the waste management collection fleet and equipment within the MLM.

Table 5-3: Waste management collection fleet and equipment gaps and needs identified

GAP IDENTIFIED	RESULTING NEED/RECOMMENDATION
Lack of equipment maintenance plan	<p>The MLM must develop a maintenance plan to proactively manage the waste vehicles and equipment which will avoid delays in waste collection and operations.</p> <p>As some of the fleet vehicles are older than 10 years the MLM must develop a replacement plan which will monitor the life of all waste vehicles and equipment and replace them when they are nearing their end-of-service life</p>

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GAP IDENTIFIED	RESULTING NEED/RECOMMENDATION
Limited fleet for waste collection	The Municipality must invest in procuring new fleets designed for waste collection and management. Currently, most of the fleets used within the Municipality for waste collection are not designed for the activity.

5.4 Waste Management Information and Reporting

Table 5-4 provides the gaps identified in terms of waste management information within the MLM

Table 5-4: Waste management information gaps and needs identified



GAP IDENTIFIED	RESULTING NEED/RECOMMENDATION
Reporting on SAWIS	All waste logs, for all three Waste Disposal Facilities, must be uploaded onto SAWIS every month.
Lack of waste volume database	The Municipality must develop a waste reporting database that will ensure record keeping of all waste volumes disposed at the three disposal facilities.
Lack of information on industrial general and hazardous waste	The MLM must source information regarding industrial general and hazardous waste categories and generation rates. There is limited information on industrial waste within MLM
Lack of information on major waste generators within the MLM	Major waste generators must be identified, and their waste logs must be received, monitored, and analysed.

5.5 Waste Education and Public Awareness

Table 5-5 provides the gaps identified in terms of waste education and initiatives within the MLM.

Table 5-5: Waste education and initiatives gaps and needs

GAP IDENTIFIED	RESULTING NEED
Lack of awareness campaigns	The MLM must conduct more waste awareness campaigns. This must involve households, schools, Municipal personnel, and the general public.

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GAP IDENTIFIED	RESULTING NEED
Lack of resources to conduct awareness education on waste management, illegal dumping, and littering	The Municipality should assign and provide resources to conduct and raise awareness on waste-related issues. Additionally, the Municipality should hire casual workers from within the communities to assist with conducting awareness campaigns.
Lack of general and domestic hazardous waste management knowledge	The MLM must make households aware of the “reduce, reuse, and recycle” practice, especially relating to general and domestic hazardous waste.
Lack of information on industrial general and hazardous waste generation	There must be awareness campaigns conducted around industrial general and hazardous waste management and disposal.
Lack of recycling information on recycling in and around the towns	The MLM must improve the availability of information on recycling collection systems.

5.6 Waste Minimisation, Recycling and Reuse Initiatives

Table 5-6 provides the gaps identified as well as the resulting needs for waste minimisation, recycling, and re-use initiatives in the MLM.

Table 5-6: Waste minimization, recycling and re-use initiatives gaps and needs identified

GAP IDENTIFIED	RESULTING NEED
Separation at source initiatives	The MLM should implement separation-at-source initiatives to promote the separation of waste. This will further promote recycling initiatives which will reduce the amount of waste entering landfills. The MLM should start a pilot programme at the household/school level and evaluate the results to implement this on a Municipal scale in the future.
Lack of waste minimization initiatives.	The MLM must develop waste minimization and prevention strategies to ensure that waste is managed effectively.
Lack of support for registered recyclers	The Municipality must provide support to registered recyclers to encourage them (e.g. provide them with appropriate PPE).

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GAP IDENTIFIED	RESULTING NEED
Lack of recycling at Waste Disposal Facilities	<p>There are a lot of recyclable materials that go to disposal (e.g. glass, cardboard, paper, plastic, metal, etc.), as such there is limited recycling, considering the amount of recyclable material at the disposal facilities.</p> <p>The MLM must register all recyclers and establish recycling operations or partnerships at the disposal facilities.</p>

5.7 Organic Waste Management

Table 5-7 provides the gaps identified as well as the resulting needs for organic waste management in the MLM.

Table 5-7: Organic waste management gaps and needs identified

GAP IDENTIFIED	RESULTING NEED
No organic waste diversion	The MLM needs to develop, implement, and maintain an organic waste diversion plan. This will reduce the organic waste being disposed of in the landfills.
Lack of knowledge of home composting	Awareness campaigns should be conducted to educate the public on composting at home and its benefits.
Lack of composting facilities	The MLM should develop composting facilities near the disposal facilities.

5.8 Hazardous Waste Management

In terms of the duty-of-care principle as required in NEMWA, generators of hazardous waste are responsible for the legally compliant management, treatment, and disposal of such hazardous waste generated. Local municipalities are legally not responsible for the management and safe disposal of hazardous waste generated by major businesses and industries within their area of jurisdiction; however, they do need to ensure that no hazardous waste is disposed of on municipal disposal facilities that are not licensed, developed, and operated to the required standards.

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Table 5-8 provides the gaps identified in terms of hazardous waste management with the associated needs.

Table 5-8: Hazardous waste gaps and needs identified

GAP IDENTIFIED	RESULTING NEED/RECOMMENDATION
Lack of household knowledge of hazardous waste	The MLM should conduct awareness campaigns around hazardous waste to educate the public about this type of waste and the different forms that it comes in. These campaigns should encourage households to return medical waste to medical centres instead of disposing of them as domestic waste. Households should also be made aware of e-waste and how to properly dispose of it. MLM must partner with PROs under EPRs scheme responsible for specific hazardous household products under the EPR scheme to assist with funds or ways of ensuring safe disposal of their products.
Allocated areas for household hazardous waste	The hazardous waste should then be transported to a hazardous disposal facility or collected by an authorised hazardous waste transporter. The Municipality should consider piloting the implementation of the National household hazardous waste strategy developed by the DFFE.
Screening of waste at landfills	All waste must be screened before entering the landfill. All hazardous waste should not be allowed in the authorised cell.

5.9 Human And Financial Resource Management

Table 5-9 provides the gaps identified in terms of staff and financial management within the MLM.

Table 5-9: Staff and financial management gaps and needs identified

GAP IDENTIFIED	RESULTING NEED/RECOMMENDATION
No budget for education and awareness	The MLM must ensure that a sufficient budget is allocated to the education and awareness campaigns/programs every year. This budget should be sufficient to conduct awareness campaigns throughout the year.
Vacancies in staff structure	All roles in the waste department's structure must be filled, therefore, the MLM must review the staff structure and appoint competent personnel for the relevant/vacant roles.

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GAP IDENTIFIED	RESULTING NEED/RECOMMENDATION
Sufficient budget provision for operational management	The MLM must ensure that there is sufficient provision made for the effective management of all waste management facilities.
Sufficient budget for procurement of waste collection fleets.	The Municipality must ensure enough budget is allocated for purchasing a sufficient waste collection fleet.

5.10 Strategic Planning.

Future planning is essential in ensuring that a waste management service can meet the changing requirements of the MLM and comply with changing legislation and best practice guidelines. **Table 5-10** provides the gaps identified in terms of strategic waste management planning with the associated need to effectively address the gap.

Table 5-10: Strategic planning gaps and needs identified

GAP IDENTIFIED	RESULTING NEED/RECOMMENDATION
Review the IWMP every 5 years	The MLM must ensure that there is sufficient budget set aside for the review and update of the IWMP every 5 years.
Operations of Waste Disposal Facilities	The MLM must ensure proper management of all sites to remain compliant with the WML and the relevant legislation.

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6 DESIRED END STATE

The desired end state entails identifying waste management priorities and goals that the Municipality wishes to attain. This will assist the Municipality in its strategic planning and prioritisation efforts to ensure that the Municipality receives the help and support it needs to achieve its intended end state. Information from the status quo report is used to develop strategic goals to address the gaps and needs of the communities within the Municipality and respond to NEM: WAA's objectives. A fully costed implementation plan, that will include strategic goals will then be developed.

7 THE NATIONAL WASTE MANAGEMENT STRATEGY (NWMS)

The NWMS 2020 was revised and updated to focus on three overarching goals that are intended to articulate the core objectives of the NEM: WAA. The strategy provides a simpler conceptual structure based on three main implementation themes framed as overarching goals informed by global emerging trends in waste management. The associated targets have been replaced with a set of strategic objectives for each goal, which will be monitored in terms of performance indicators.

7.1 National Waste Management Strategy 2020

The three goals of the NWMS 2020 that will be used to align this IWMP are as follows:

- **Goal 1:** Waste Minimisation - the aim is to prevent waste and where waste cannot be prevented, 40% should be diverted from landfill within 5 years through reuse, recycling, recovery and alternative waste treatment: 25% of waste reduction in waste generation and 20% waste reused in the economic value chain.
- **Goal 2:** Effective and Sustainable Waste Services - this would see all South Africans living in clean communities with waste services that are well-managed and financially sustainable.
- **Goal 3:** Waste Awareness and Compliance - the aim is to create a culture of compliance with zero tolerance for pollution, litter and illegal dumping.

7.2 Eastern Cape Provincial Integrated Waste Management Plan (PIWMP)

Eastern Cape Provincial, Department of Economic Development and Environmental Affairs (DEDEA) developed a Provincial Integrated Waste Management Plan (PIWMP) 2022-2026). Eight objectives were defined based on the results of the needs analysis namely:

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- **Goal 1** - Ensure sufficient institutional capacity to implement integrated waste management;
- **Goal 2** - Improved integrated waste management and future planning;
- **Goal 3** - Increased waste minimisation, re-use, recycling and recovery;
- **Goal 4** - Effective waste information management;
- **Goal 5** - Improved waste facility management;
- **Goal 6** - Provide effective and financially viable services;
- **Goal 7** - Improved education, awareness and waste information sharing; and
- **Goal 8** - Effective compliance monitoring and enforcement.



7.3 Goals Identified for the MLM's IWMP

To align the MLM's goals with the Eastern Cape PIWMP as well as the NWMS 2020, the following goals have been formulated:

- **Goal 1:** Effective solid waste service delivery.
- **Goal 2:** Promote waste minimisation and recycling.
- **Goal 3:** Ensure safe and integrated management of hazardous waste.
- **Goal 4:** Improved waste education and public awareness.
- **Goal 5:** Ensure sound budgeting for integrated waste management.
- **Goal 6:** Improve regulatory compliance.
- **Goal 7:** Improve waste information management.

7.4 Roles and Responsibilities of local government as per the NWMS 2020

District and Local Municipalities are critical in the implementation of NWMS goals as they are responsible for the planning and delivery of waste collection, disposal services, and infrastructure. District municipalities are primarily responsible for providing technical support to local municipalities and assisting with regional planning and coordination. Waste collection and disposal to landfills is typically undertaken by local municipalities. As part of the implementation of the NWMS, local government needs to shift the focus of waste collection services to incorporate separation at source to promote diversion of waste from landfills through reuse, recycling, and recovery. Addressing waste management issues that are specific to the economic, social, and environmental profile of the Municipality is key to ensuring effective waste management.



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8 ALIGNMENT WITH THE NWMS 2020 AND EASTERN CAPE PIWMP GOALS



Table 8-1 below outlines how the goals of the MLM IWMP align with the NWMS 2020 and Eastern Cape PIWMP goals.

Table 8-1: Alignment of MLM goals with the NWMS 2020 and Eastern Cape PIWMP goals

MLM GOAL	EC PIWMP GOAL	NWMS 2020 GOALS
Goal 1: Effective and financially viable solid waste service delivery.	Goal 6: Provide effective and financially viable services	Goal 2: Effective and Sustainable Waste Services - this would see all South Africans living in clean communities with waste services that are well-managed and financially sustainable.
Goal 2: Promote waste minimisation and recycling.	Goal 3: Increased waste minimisation, re-use, recycling and recovery	Goal 1: Waste Minimisation - the aim is to prevent waste and where waste cannot be prevented, 40% should be diverted from landfill within 5 years through reuse, recycling, recovery and alternative waste treatment: 25% of waste reduction in waste generation and 20% waste reused in the economic value chain.
Goal 3: Ensure safe and integrated management of hazardous waste.	Goal 2: Improved integrated waste management and future planning	Goal 2: Effective and Sustainable Waste Services—This would see all South Africans

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MLM GOAL	EC PIWMP GOAL	NWMS 2020 GOALS
		living in clean communities with well-managed and financially sustainable waste services.
Goal 4: Improved waste education and public awareness.	Goal 7: Improved education, awareness and waste information sharing	Goal 3: Waste Awareness and Compliance - the aim is to create a culture of compliance with zero tolerance for pollution, litter and illegal dumping.
Goal 5: Ensure sound budgeting for integrated waste management.	Goal 1: Ensure sufficient institutional capacity to implement integrated waste management	Goal 2: Effective and Sustainable Waste Services - this would see all South Africans living in clean communities with waste services that are well-managed and financially sustainable.
Goal 6: Improve regulatory compliance.	Goal 5: Improve waste facility management Goal 8: Effective compliance monitoring and enforcement	Goal 3: Waste Awareness and Compliance - the aim is to create a culture of compliance with zero tolerance for pollution, litter and illegal dumping.
Goal 7: Improve waste information management.	Goal 4: Effective waste information management	Goal 2: Effective and Sustainable Waste Services - this would see all South Africans living in clean communities with waste services that are well-managed and financially sustainable.

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9 SETTING STRATEGIC GOALS, OBJECTIVES, TARGETS AND ALTERNATIVES FOR MLM

The achievement of the strategic goals and targets within the allotted timeframes from the date the IWMP is approved must have a quantifiable target date and precise timeframe. The target date for each strategic goal can also be allocated to the following three broad timeframes as follows:

- Short term Targets (Attainable within 0 to 1 year)
- Medium Term Targets (Attainable within 1 to 3 years)
- Long Term Targets (Attainable within 4-7 years)

The strategic goals that must be accomplished are listed in **Table 9-1** below. The strategic goals are informed by waste management issues and observations identified during the status quo analysis. The waste management hierarchy serves as a guide for the established strategic goals, which are based on waste legislation and policies. To assess the achievement of accomplishing a goal, key performance indicators are also included for the relevant goals. The instruments to be utilized are given, and the sphere of government responsible for implementation is identified and listed, given the fact that responsibilities regarding waste management differ throughout government structures. Lastly, an estimated budget is provided to allow for appropriate financial planning.







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Table 9-1: Strategic Goals, Targets, Indicators, and alternatives



GOAL 1: EFFECTIVE AND FINANCIALLY VIABLE SOLID WASTE SERVICE DELIVERY				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 1: Review and update the waste collection schedule	<ul style="list-style-type: none"> Review and update the collection schedule to ensure efficient collection in all households within the municipality. 	Revised collection schedule which includes all households within the municipality.	LM	The MLM has a legal mandate to provide a waste collection service. The nature of the service will depend on the type and location of the residential developments. There is no alternative for this action.
Objective 2: Evaluate waste management fleet	<ul style="list-style-type: none"> Evaluate waste collection vehicles to ensure that they remain reliable, cost-effective, and efficient. Ensure that daily routine inspections are done on vehicles before waste collection commences. Undertaken preventative maintenance on vehicles where appropriate. 	Vehicle/plant/equipment Maintenance Plan, and Vehicle/plant/equipment Replacement Plan	LM	The purpose of this action is to ensure the waste management fleet remains operational and in a good condition. An alternative would be to hire a fleet or outsource refuse collection. Therefore, no alternative is recommended.

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GOAL 1: EFFECTIVE AND FINANCIALLY VIABLE SOLID WASTE SERVICE DELIVERY				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
	<ul style="list-style-type: none"> Plan and budget for future fleet, plant, and equipment requirements allowing for routine replacement of vehicles that are not reliable. Ensure that the landfill used for disposal is equipped with plant and tow cables to assist vehicles stuck in mud and do not allow waste collection vehicles to be pushed by bulldozers or landfill compactors. Have access to backup vehicles under all circumstances. 			
Objective 3: Prevent illegal dumping	Identify additional illegal dumping hotspots and add receptacles in these areas. The waste management officer should assess potential reasons causing	Number of cleaning campaigns and awareness conducted	LM & Province	This action reduces waste and littering in communities. Illegal dumping should be eliminated in communities to promote clean

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GOAL 1: EFFECTIVE AND FINANCIALLY VIABLE SOLID WASTE SERVICE DELIVERY				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
	<p>the prevalence of illegal dumping by way of:</p> <ul style="list-style-type: none"> Identifying illegal dumping hotspots and the stream of waste (and possible potential sources) that is predominant at the illegal dumping sites. Monitor and empty skips as required to prevent overfilling and waste subsequently being put on fire. Launch waste awareness campaigns to educate the community on proper waste management and disposal practices. 	<p>as well as reduced illegal dumps.</p> <p>Increased number of skip bins provided.</p>		<p>and healthy environment.</p> <p>Therefore, there is no recommended alternatives for this action.</p>

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GOAL 1: EFFECTIVE AND FINANCIALLY VIABLE SOLID WASTE SERVICE DELIVERY				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 4: Expansion of waste service area	<ul style="list-style-type: none"> Identify the areas that are currently not receiving waste collection services and expand waste collection services to un-serviced households. Expand the current servicing to these identified areas in a phased manner. 	Increased number of serviced households	LM	There is no feasible alternative to this service delivery as the Municipality is required to extend waste service delivery to households within the municipality.
Objective 5: Cost reflective tariffs are charged to residents and business.	<ul style="list-style-type: none"> Review waste tariffs to include waste disposal at WDFs fees. The waste service tariff reviews are to be informed by a full cost accounting exercise. 	Reviewed waste tariffs.	LM	There is no feasible alternative to this project. A review of the waste tariffs based on the outcome of the full cost accounting exercise is needed.
Objective 6: Establish drop-off facilities	<ul style="list-style-type: none"> Drop-off facilities must be established at strategic areas within the MLM. It is recommended that these facilities be developed in illegal dumping hot-spot areas. 	Number of drop-off facilities	LM & Province	Effective separation at source with colour coded plastic bags/bins could be introduced in areas with high illegal hotspots and effective awareness

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GOAL 1: EFFECTIVE AND FINANCIALLY VIABLE SOLID WASTE SERVICE DELIVERY				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
				campaigns. This will reduce the number of drop-off facilities needed within the municipality.
GOAL 2: PROMOTE WASTE MINIMISATION AND RECYCLING				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 1: Develop separation at source programmes	<ul style="list-style-type: none"> Develop and implement a separation at source programme at the household/school level. The results from this programme should be used to develop a Municipal-wide programme in the future. 	Number of completed programmes	LM & Province	There is no viable alternative to this project. Alternatives could however be considered in how the separation at source programs are undertaken e.g. school recycling competitions, composting programs etc.

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GOAL 2: PROMOTE WASTE MINIMISATION AND RECYCLING				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 2: Prevent and minimize organic waste generation	<ul style="list-style-type: none"> Promote home composting and establish a collection system for organic waste through education and awareness. Establish composting facilities at or near landfill sites. 	<p>Feedback from households on composting programme.</p> <p>Number of composting facilities within the MLM.</p>	LM & Province	<p>An alternative could be to provide households with a food waste bin and then collect and transport the food waste to a central composting facility. The MLM does however not have the human resources, vehicles or budget available to undertake such a programme at present. Raising awareness regarding home composting of food waste would be a better intervention.</p>

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GOAL 2: PROMOTE WASTE MINIMISATION AND RECYCLING				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 3: Integration of waste pickers	<ul style="list-style-type: none"> The MLM should register additional waste pickers and have them service landfills for recyclable materials. 	Number of registered waste pickers	LM	There is no alternative to this action since Municipalities are required to integrate waste pickers into their waste functions.
Objective 4: Establishment of drop-off facilities/buy-back centres	<ul style="list-style-type: none"> Provide public recycling drop-off facilities in secured areas and have material removed regularly to prevent overflowing containers. Establish buy-back centres in low-income areas. 	Number of drop-off facilities/buy-back centres	LM & Province	An alternative to this would be to expand the pilot clear and black plastic bag programme currently running in Makhandla to all areas within the municipality and launch a two-bag system for all households. This should be accompanied by effective awareness on importance of separation at source.

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GOAL 2: PROMOTE WASTE MINIMISATION AND RECYCLING				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
				Buy-back centres are needed to encourage recycling in low income areas. There are no alternatives to this project but there are various different methods of implementation.
Objective 5: Promote recycling	<ul style="list-style-type: none"> Implement recycling competitions and other awareness programs at schools. Conduct Municipal-wide recycling awareness campaigns. Recycling must be implemented into the daily operations at all landfills. 	Amount of waste recycled	LM, DM & Province	Launch a recycling programme at 6 schools through a competition (3 primary schools and 3 secondary schools) and expand to other schools based on the lessons learnt from the existing programme.

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GOAL 3: ENSURE SAFE AND INTEGRATED MANAGEMENT OF HAZARDOUS WASTE.				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 1: Provide household hazardous waste solutions; and provide systems for safe collection, storage as well as transport and appropriate disposal of all hazardous waste generated in and around MLM	<ul style="list-style-type: none"> Provide containers for household hazardous waste at public drop-off locations and arrange for an authorized contractor to collect and dispose of the material. Raise public knowledge of any alternate systems for collecting and disposal of hazardous waste that may be accessible to them, as well as the effects improper hazardous waste disposal has on the environment. 	<p>Number of containers provided for hazardous waste.</p> <p>Number of hazardous waste awareness campaigns.</p>	LM, DM & Province	It is noted that the National Domestic Waste Collection Standards require municipalities to provide communal collection points for non-mainstream recyclables such as batteries and fluorescent tubes for collection by a private service provider. The MLM does not currently provide such facilities, however, this should be investigated carefully before implementation. Alternately this could be outsourced but it is not recommended.

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GOAL 3: ENSURE SAFE AND INTEGRATED MANAGEMENT OF HAZARDOUS WASTE.				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 2: Registration of major hazardous waste generators on SAWIS	<ul style="list-style-type: none"> Determine the types and volumes of hazardous waste generated, as well as the key producers of hazardous waste in the MLM. Keep an eye on the major generators of hazardous waste in the MLM and ensure that they are registered and accurately reported on a regular basis. 	Data logs on hazardous waste from major generators.	LM	An alternative will be to publish information and raise awareness for businesses to report their waste on SAWIS to ensure that hazardous waste generated within the municipality is accounted for.
Objective 3: Screening of waste at landfills for hazardous waste	<ul style="list-style-type: none"> Waste must be screened at all landfills before disposal into the cells. All hazardous waste must be removed and not be allowed to be disposed of in the cells. 	Screening logs	LM	There is no alternative for this action. The Municipality must screen all the waste entering waste disposal sites to ensure that waste disposed of is allowed in a general waste landfill.

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GOAL 4: IMPROVED WASTE EDUCATION AND PUBLIC AWARENESS				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 2: Create or gain access to appropriate training programmes for waste management	<ul style="list-style-type: none"> Launch community-based waste management awareness and education campaigns for rural areas and council members. Provide funding for and guarantee that staff members in the waste management division receive frequent training to guarantee adherence to the implementation of waste management policies, procedures, and acts. Guarantee that personnel in the public and private sectors receive the training necessary for their positions, as well as refresher courses. 	Number of completed training programmes and trained personnel	LM & Province	There is no viable alternative to this action. Alternatives could however be considered in how the awareness campaigns are undertaken.
Objective 3: Improve hazardous waste	<ul style="list-style-type: none"> To make sure the officials are prepared to instruct other employees 	Number of awareness campaigns	LM, DM & Province	There is no viable alternative to this project. Alternatives could

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GOAL 4: IMPROVED WASTE EDUCATION AND PUBLIC AWARENESS				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
awareness and management expertise.	<p>and members of the public on the proper handling of hazardous waste, send the necessary officials on formal training courses (training the trainers).</p> <ul style="list-style-type: none"> • Make sure households are informed about the effects of home hazardous waste by providing educational materials. • Give residents instructions on how to properly dispose of hazardous waste at the facilities that the MLM provides and maintains. 			however be considered in how the awareness campaigns are undertaken.

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GOAL 5: ENSURE SOUND BUDGETING FOR INTEGRATED WASTE MANAGEMENT				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 1: Evaluate staff structures, adjust where required and obtain approval for reallocation of existing / appointment of new staff.	<ul style="list-style-type: none"> Survey to ascertain the necessary personnel complement and modify the organogram as necessary. Reassign redundant employees to other roles that require qualified candidates with relevant expertise to fill them. Provide alternative training where feasible. Assign relevant, experienced, and qualified personnel to open jobs. Make sure that the waste management department's openings are funded sensibly and by the finalized organogram. 	Appointment of new staff and completion of organogram	LM	The alternative to this project would be to outsource functions covered by vacant positions. This is not deemed as a suitable alternative, therefore, MLM should focus on building expertise internally and the cost to outsource will likely be higher than to appoint employees.

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GOAL 5: ENSURE SOUND BUDGETING FOR INTEGRATED WASTE MANAGEMENT				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 2: Ensure the availability of a sufficient budget for landfill extension, or rehabilitation and closure	<ul style="list-style-type: none"> Make provision for any potential extensions to the landfill or the potential closure and rehabilitation of the landfills. Select competent experts and contractors that can do the work within the stipulated timelines and for the agreed-upon price. 	Landfill budget plan	LM	
Objective 3: Waste awareness budget	<ul style="list-style-type: none"> There must be a sufficient budget set aside for a waste awareness campaign for each year. A dedicated team should be employed to manage these campaigns. 	Number of awareness campaigns	LM, DM & Province	There is no viable alternative. In order to successfully conduct awareness campaigns, the MLM should ensure a budget is allocated for this activity.



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GOAL 5: ENSURE SOUND BUDGETING FOR INTEGRATED WASTE MANAGEMENT



Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 4: Ensure a sound budget for integrated waste management planning.	<ul style="list-style-type: none"> Review the IWMP Ensure that the municipal council approve the IWMP and that the approved IWMP is endorsed. Ensure that the endorsed IWMP is included in the IWMP 	Reviewed IWMP and endorsed IWMP.	LM, DM, Province & National	There is no alternative for this action. The MLM is required to review the IWMP every 5 years.

GOAL 6: IMPROVE REGULATORY COMPLIANCE



Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 1: Review and develop appropriate waste management by-laws based on	<ul style="list-style-type: none"> Review the current by-laws to identify areas of improvement. 	Reviewed and approved Waste By-laws	LM	There is no viable alternative to this project.

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GOAL 6: IMPROVE REGULATORY COMPLIANCE				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
proposed new circumstances				
Objective 2: Improve management and maintenance of the landfill site.	<ul style="list-style-type: none"> Identify a sustainable resource for cover material. Procure and install a weighbridge at the landfill. Acquire necessary yellow fleet <ul style="list-style-type: none"> - TLB - Bulldozer - Tipper Truck 	Identified sustainable source for cover material. Installed weighbridges. Acquired yellow fleet.	LM & Province	The purpose of this action is to ensure the waste management fleet is enough for efficient operations. An alternative would be to hire in fleet or outsource the machinery. This is not recommended, as it will results in higher monthly expenditure for MLM.
Objective 3: Conduct external landfill audits as per landfill licence requirements and implement	<ul style="list-style-type: none"> Continue with quarterly internal audits. Examine all landfill waste management licenses to determine the dates of external audits. 	Number of external audits conducted	LM & DM	There is no viable alternative to this project.

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GOAL 6: IMPROVE REGULATORY COMPLIANCE				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
remedial actions by a schedule approved by both the municipality as well as the regulating authority	<ul style="list-style-type: none"> All waste management facilities should designate an external consultant to carry out audits as stipulated in the respective WMLs. Carry out normal maintenance and when necessary, apply mitigation measures based on expert recommendations. 			

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GOAL 7: IMPROVE WASTE INFORMATION MANAGEMENT				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
Objective 1: Logging of waste volumes	<ul style="list-style-type: none"> All waste entering the landfills must be logged manually as there are no weighbridges at these sites. These logs must be kept on-site as well as saved electronically. 	Waste volume logs	LM	There is no alternative to this action, as the Municipality needs to record its waste in order to report on SAWIS.
Objective 2: Updating SAWIS	<ul style="list-style-type: none"> All landfills must log their waste volumes on SAWIS every quarter. 	Waste data uploaded to SAWIS	LM	There is no alternative to this action, as the Municipality is obligated to report all the waste disposed at the landfills.
Objective 3: Develop an industry waste database with regular and accurate data reporting.	<p>Put in place a system of efficient communication:</p> <ul style="list-style-type: none"> Create a database of industries operating in the MLM and monitor the status of their registration and reporting. 	Industry waste database	LM	There is no feasible alternative to this project.

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GOAL 7: IMPROVE WASTE INFORMATION MANAGEMENT				
Objectives	Target	Key Performance Indicator	Responsible Department	Alternatives
	<ul style="list-style-type: none"> Publish an advertisement in the local newspaper directing organizations to register. Provide registration forms on the Municipal website. Notify the organizations in writing if they fail to register or submit proper reports. 			

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10 IMPLEMENTATION PLAN

The following section provides an implementation strategy to help the MLM achieve the goals and targets mentioned in the gap and needs analysis.

The implementation plan outlines several initiatives and related tasks that, if carried out correctly, should help the MLM meet its goals. The projects that have been selected have been ranked in order of priority and cover the years 2025-2029. The implementation plan is outlined in **Table 10-2** below.

An estimated budget is provided to allow for appropriate financial planning. The achievement of the strategic goals and targets within the allotted timeframes from the date the IWMP is endorsed must have a quantifiable target date and precise timeframe. The target date for each strategic goal can also be allocated to the following three broad timeframes as follows:

- Short-term targets (Attainable within 0 to 1 year)
- Medium-term targets (Attainable within 1 to 3 years)
- Long-term targets (Attainable within 4 to 7 years)

The implementation plan's legend is shown in the **Table 10-1** below.

Table 10-1: Implementation plan legend

TERM	
Short-term	
Medium-term	
Long-term/continuous	







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Table 10-2: Implementation plan



GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
Goal 1: Effective solid waste service delivery	Objective 1: Update the waste collection schedule	Revised collection schedule which includes areas that are currently not receiving service delivery.						LM	Human Resources.
	Objective 2: Evaluate waste management fleet	Vehicle/plant/equipment Maintenance Plan, and Vehicle/plant/equipment Replacement Plan.						LM	Human Resources
	Objective 3: Prevent illegal dumping	Maintain regular clean-ups and turn open spaces into sustainable projects e.g. community crop farming						LM & Province	Internal expenditure as determined by operations.

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
		Cleaning campaigns and awareness of illegal dumping Increased number of skip bins provided.							R100 000
	Objective 4: Expansion of waste service area	Increase the number of serviced households.						LM	Human Resources
	Objective 5: Cost-reflective tariffs are charged to residents and businesses.	Review waste tariffs to include waste disposal at WDFs fees.						LM	Human Resources

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
	Objective 6: Establish drop-off facilities	Development and operation of multiple drop-off facilities within the MLM. Partnerships between the municipality and PROs to assist with financing the development of these facilities.						LM & Province	Internal expenditure as determined by operations.
Goal 2: Promote waste minimisation and recycling	Objective 1: Develop separation at source programmes	Development and implementation of separation at source programmes.						LM	Internal expenditure as determined by operations.

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
	Objective 2: Prevent and minimize organic waste generation	Promoting home composting and acquiring feedback from households.						LM	Human Resources
		Establish composting facilities within the MLM.						LM & Province	Internal expenditure as determined by operations
	Objective 3: Integration of waste pickers	Register waste pickers at landfills.						LM	Human Resources

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
	Objective 4: Establishment of drop-off facilities/buy-back centres	Development and operation of drop-off facilities and buy-back centres within the MLM.						LM & Province	Internal expenditure as determined by operations.
	Objective 5: Promote recycling	Promote recycling through campaigns and collect data. Recycling is to be implemented at landfills.						LM, DM & Province	Internal expenditure as determined by operations. Human Resources
Goal 3: Ensure safe and integrated	Objective 1: Provide household hazardous waste	Provide containers for hazardous waste.						LM, DM & Province	R100 000 .

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
management of hazardous waste	solutions; and provide systems for safe collection, storage as well as transport and appropriate disposal of all hazardous waste generated in and around MLM	Conduct hazardous waste awareness campaigns within the MLM.							
	Objective 2: Registration of major hazardous waste generators on SAWIS	Acquire data logs from all major hazardous waste generators in the MLM.						LM	Human Resources

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
	Objective 3: Screening of waste at landfills for hazardous waste	Waste must be screened and logged before entering the landfills.						LM	Internal expenditure as determined by operations.
Goal 4: Improved waste education and public awareness	Objective 1: Implement waste awareness programmes	<p>Post recycling-related information on notice boards at places of interest.</p> <p>Encourage recycling and inform people about suitable locations for dropping off recyclables.</p> <p>Conduct regular awareness campaigns throughout the Municipality and run recycling</p>						LM, DM, Province	<p>Internal expenditure as determined by operations.</p> <p>An average budget for the winning school can be R10 000.00 once-off</p>

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
		<p>competitions in schools within MLM.</p> <p>There must be awareness campaigns conducted around industrial general and hazardous waste management and disposal.</p> <p>Hire interns/graduates to assist with environmental awareness campaigns in schools and the community at large</p>							<p>(recycling competition).</p> <p>R6000 per month for each graduate.</p>

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
	Objective 2: Create or gain access to appropriate training programmes for waste management	Conduct training programme for internal staff.						LM & Province	Internal expenditure as determined by operations.
	Objective 3: Improve hazardous waste awareness and management expertise.	Conduct internal and external hazardous waste awareness campaigns throughout the MLM.						LM, DM & Province	Internal expenditure as determined by operations.
Goal 5: Ensure sound budgeting for integrated	Objective 1: Evaluate staff structures, adjust where required and	Complete the department's organogram by appointing the relevant personnel to fill vacant positions.						LM	Internal expenditure as determined by operations.

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
waste management	obtain approval for reallocation of existing / appointment of new staff.								
	Objective 2: Ensure the availability of a sufficient budget for landfill extension, or rehabilitation and closure	Set up a budgeting plan for the potential landfill extension, or rehabilitation and closure.						LM	Internal expenditure as determined by operations.
	Objective 3: Waste awareness budget	Set up a budget for awareness campaigns on an annual basis.						LM, DM & Province	Internal expenditure as

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
									determined by operations.
	Objective 4: Ensure a sound budget for integrated waste management planning.	Review the Municipality IWMP Ensure that the municipal council approve the IWMP and that the approved IWMP is endorsed. Ensure that the endorsed IWMP is included in the IWMP						LM, Province & National DM, &	R400 000
Goal 6: Improve regulatory compliance	Objective 1: Review and develop appropriate waste management by-	Approve, publish, and enforce the by-laws.						LM	R75 000

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
		-Tipper Truck							-R 2 500 000
		-Compactor Truck							-R11 000 000 and MIG
		Install a gate at Alicedale WDF.							R15 000
		Upgrade fence at Riebeek East and Alicedale WDFs.							R100 000
		Construction of sanitation facility at Riebeek East and Alicedale WDF.							R400 000
		Install a lockable gate at Alicedale WDF							R20 000
		Install Notice boards at Riebeek East and Alicedale WDF							R30 000

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
	Objective 3: Conduct external landfill audits as per landfill licence requirements and implement remedial actions by a schedule approved by both the municipality as well as the regulating authority	Appoint a competent service provider to conduct external landfill audits per the respective WML conditions.						LM & DM	R50 000 per audit.
Goal 7: Improve waste	Objective 1: Logging of waste volumes	Keep logs of all waste volumes and types that enter and are disposed of at the landfills.						LM	Human Resources

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GOAL	OBJECTIVE	ACTIVITY	TIMEFRAME					RESPONSIBLE DEPARTMENT	ESTIMATED BUDGET REQUIRED
			2025	2026	2027	2028	2029		
information management	Objective 2: Updating SAWIS	All waste data must be uploaded onto SAWIS quarterly.						LM	Human Resources
	Objective 3: Develop an industry waste database with regular and accurate data reporting.	Compile a database of all major industry waste generators in the MLM. This database must be updated monthly with the new waste volumes and types generated.						LM	Human Resources

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11 IMPLEMENTATION INSTRUMENTS

11.1 Partnerships

The development of partnerships has been identified as an important mechanism for providing the required support for the implementation of the IWMP. The costs and needs of a sustainable waste management system are very high and therefore require contribution and participation from its various stakeholders. A wide range of partnerships that can be formed including Public-Public, Public-Private and Public-Community partnerships.

11.1.1 Public-Public Partnerships

This is a partnership between two public sector institutions or organisations where neither partner seeks to profit from the partnership. Existing public-public partnerships include DFFE-EPWP, DFFE partnered with the Municipality to sponsor the development of IWMP. The municipality is encouraged to explore other partnerships with the district, province, health facilities, schools etc.

11.1.2 Public-Private Partnerships

This is a partnership between a public sector and a private company. Typically, this involves private capital financing government projects. The Municipality previously had financial funding; however, the funds are exhausted. There are currently no existing partnerships, the Municipality is encouraged to partner with the private sector for sustainable waste management services.

11.1.3 Public-Community Partnerships

This is a partnership between the public sector and community (Non-Government Organisation (NGO)/Community-Based Organisation (CBO). The Municipality has an existing partnership with the Kagiso Trust, which will be assisting in identifying, clearing up and the redevelopment of illegal hotspots.

11.2 Legislative Instruments: Development and Enforcement of By-law

Waste management By-laws as supporting legal framework must be finalised and gazetted to support the implementation of IWMPs. Municipalities have the power to develop By-laws, which augment national and provincial regulatory requirements. Municipalities must also enforce these waste management By-laws through municipal mechanisms such as EMIs or other delegated authority within Municipalities.

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11.3 Funding Mechanisms

The successful implementation of the IWMP depends on the availability of sufficient funding to carry out the plan. Funding will be required for the following:

11.3.1 Funding Mechanisms for Waste Prevention, Minimisation and Recycling

The primary source of initial funding for the waste prevention, minimisation and recycling activities may be sourced from:

- Recycling agencies
- Municipal budget
- Donor funding
- Public/private partnerships

11.3.2 Funding Mechanisms for Waste Collection and Transportation

Possible sources for waste collection and transportation include:

- Payment for services rendered
- Local government budgetary allocations (from Equitable share funding allocation);
- Municipal budget allocations
- Donor funding for specific projects
- Public-private partnerships.

11.3.3 Funding Mechanisms for Waste Disposal

- Waste disposal tariffs
- Public-private partnerships

12 MONITORING AND REVIEW OF THE IWMP

It is necessary to continuously and regularly monitor the Implementation Plan to make sure the IWMP's targets, goals, and objectives are met within the allotted time limits.

According to Section 13(2) of NEMWA, performance reports on the implementation of the integrated waste management plan must be prepared in terms of Section 46 of the MSA and must contain the following information:

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- The extent to which the plan has been implemented during the period;
- The waste management initiatives that have been undertaken during the reporting period;
- The delivery of waste management services and measures taken to secure the efficient delivery of waste management services, if applicable;
- The level of compliance with the plan and any applicable waste management standards;
- The measures taken to secure compliance with waste management standards;
- The waste management monitoring activities;
- The actual budget expended on implementing the plan; and
- The measures that have been taken to make any necessary amendments to the plan.

The MLM must appoint a WMO who will be responsible for implementing and managing the IWMP. The MLM's progress toward achieving the aims, targets, and objectives specified in the Implementation Plan of the IWMP must be summarized in an Annual Performance Report which must be compiled by the WMP. The following should be included in the report:

- **Strategic Issues:** The effectiveness of the MLM and its advancement toward achieving its short-, medium-, and long-term goals, objectives, and targets.
- **Financial Issues:** Budget forecasts reporting, securing adequate funds, and budgetary restrictions concerning both current waste management operations and this IWMP's implementation.
- **IWMP Amendments:** Modifications to the IWMP required by the findings of financial restrictions, feasibility studies, etc.
- **Communication:** Informing people, important stakeholders, and council members about the status of the IWMP's meeting.

The next review of the IWMP should take place in 2030, as it is a component of the Integrated Development Plan mandated by Chapter 5 of the MSA.

To continuously improve on the current level of waste management services in the MLM, the thorough review will update the status quo, assess overall progress regarding the goals, objectives, and targets specified in this IWMP, examine any gaps and needs, and reformulate the goals and objectives as necessary to further advance the waste management services provided by the MLM.

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13 PUBLIC PARTICIPATION PROCESS

As part of the development of the IWMP, the consultants will engage with stakeholders and members of the community. Stakeholders and interested and affected parties (I&APs) will be notified that the draft IWMP is out for comment. The comments on the Draft MLM IWMP will be incorporated into the Final MLM IWMP.

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14 CONCLUSION

This report is intended to provide an overview of the current waste management practices undertaken as well as the gaps and needs identified within the Municipality. It also indicates the planning context within which the IWMP for the Municipality is formulated, as well as additional legislative frameworks that need to be considered when undertaking the compilation of an IWMP.

Based on current information, from Stats SA, 2022, there has been an increase in population growth from 80 390 which was recorded in 2011 to 97 815 recorded in 2022. Total number of households increased from 21 388 to 29 239. The increased population puts more pressure with regards to the service delivery expected from the Municipality. The municipality is currently collecting waste from all households and all registered indigent households are being serviced.

The Municipality consists of three waste disposal facilities which are licensed. The disposal facilities do not have operational weighbridges and incoming waste volumes are not recorded. This results in waste disposal volumes not reported on SAWIS. Waste recycling is limited and there are no waste reclaimers within the Municipality except for Makhanda, as a result, there were huge volumes of recyclables observed at the waste disposal facilities (Riebeeck East and Alicedale). Illegal dumping is one of the biggest challenges within the municipality, other challenges that the Municipality encounters; amongst others include limited human resources, air space, waste operation equipment, and specialised waste management vehicles needed for proper site management.

The analyses of the current waste management system have led to the identification of gaps and needs (Section **Error! Reference source not found.**), and these are addressed with the overarching goals, objectives, and targets in Section 9.

The main goals for integrated waste management in MLM can be summarized as follows:



- To ensure effective solid waste service delivery;
- To promote waste minimisation and recycling;
- To ensure safe and integrated management of hazardous waste;
- To improve waste education and public awareness;

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- To ensure sound budgeting for integrated waste management;
- To improve regulatory compliance; and
- To improve waste information management.

For these goals to be met, a series of implementation instruments (action plans) will need to be implemented. These action plans are detailed in the Implementation Plan in this Section 10 of this report. The MLM must take action on the items proposed in the Implementation Plan as this will directly result in improved waste management of the Municipality.

As part of the development of the IWMP, the consultants will engage with stakeholders and members of the community. Stakeholders and I&APs will be notified that the Draft IWMP is out for comment. The comments on the Draft MLM IWMP will be incorporated into the Final MLM IWMP.

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