

DRAFT INTEGRATED WASTE MANAGEMENT PLAN (IWMP)

3rd Generation

February 2023

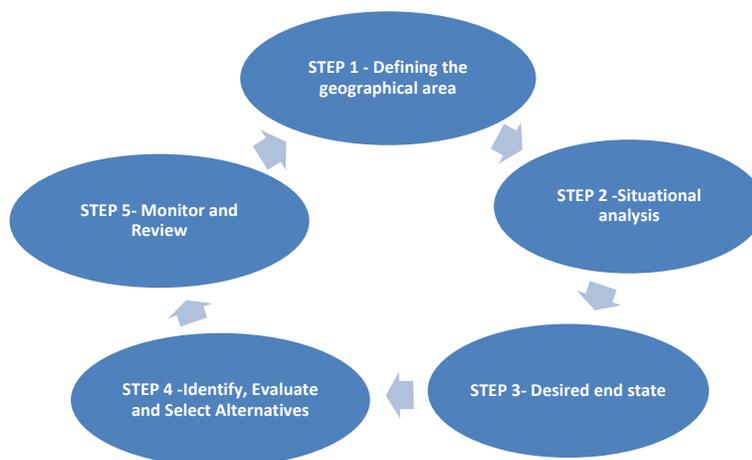
Emalahleni Local Municipality

EXECUTIVE SUMMARY

Background

In terms of section 11 of the National Environmental Management: Waste Act 59 of 2008, municipalities are required to prepare Integrated Waste Management Plans (IWMP) to be included in their Integrated Development Plan (IDP). An IWMP is a 5-year plan prepared in accordance with section 12 of the NEMWA, 2008 and Department of Environment Affairs and Tourism (DEAT), 2012 guidelines for the Development of IWMPs. It outlines various aspects of waste management, including the collection, storage, and disposal of waste, source reduction, recycling and composting, facility management, and budgeting and financing. Simply put, it is a plan that describe actions, activities and resources that shall be needed to bring about changes and improvements to the waste management delivery system of the municipality.

In 2008 the Emalahleni Local Municipality (ELM) prepared its 1st generation IWMP which was approved by the Municipal Council and subsequently incorporated into the IDP of the municipality, most unfortunately, the 2008 IWMP could not be reviewed at the lapse of its 5-year period in 2012. This meant that the municipality was unable to develop its 2nd generation IWMP for implementation during the period 2013 – 2017. This document represent the 3rd Generation IWMP prepared by the municipality in-house with the assistance from the National Department of Forestry, Fisheries and Environmental (DFFE) and it is effectively aligned with the 2022-2026 IDP cycle of the municipality, as provided for in the Municipal Systems Act (MSA). The preparation of the IWMP entailed the following process;



STEP 1 – A description of the geographical area which gives an overview of the study area in terms of size, brief main socio-economic activities, towns and villages which constitute the municipality, wards under the municipality and a locality map of the municipality depicting the location of towns and villages and possibly economic sectors which will provide a glimpse of the situational analysis.

STEP 2 – A situation analysis includes a description of the population and development profiles of the study area to which the plan relates, an assessment of the quantities and types of waste types that are generated in that area, a description of the services that are provided or that are available for the collection, minimisation, re-use, recycling, and recovery, treatment and disposal of waste and lastly the number of persons in the area who are not receiving waste collection services. Furthermore, this step briefly completes the institutional, financial, political, legal and physical conditions which are translated into the desired end state.

STEP 3 – A desired end state sets out the goals and targets to achieve the implementation of the IWMP. The desired end state provides a narrative of elements in terms of institutional, financial, political, legal and physical conditions. All of these elements are in relation to the situation analysis and goals and targets within the five-year period of implementation.

STEP 4 - The identification of alternatives or developing and implementation plan to achieve the goals and targets that have been set in the desired end state is very crucial. The identified alternatives are evaluated to assess environmental, technical, social, financial, institutional and organisational arrangements and impacts in the context of climate change and just energy transition. The evaluation of alternatives translated into choosing the best alternative to achieve the goals and targets set in the desired end state. It is crucial to develop an implementation plan for the implementation of an IWMP.

STEP 5 – Monitoring and Review is the last step in the IWMP process, although this happens outside the development of the plan. Section 13 (3) of the Waste Act requires that annual performance reports be prepared in terms of section 46 of the Municipal Systems Act (MSA) and must contain information on the implementation of the municipal IWMP, including the information set out in paragraph (a) to (j) of subsection (2) insofar as it relates to the performance of the municipality.

The above processes constitute chapters to this document and they are elaborated in details in the forthcoming paragraphs.

In preparing this document, the following primary sources which underpins baseline information were used;

- i. ELM Section 78 study on the Alternative Service Delivery Mechanism for Solid Waste Management, 2020,
- ii. ELM Integrated Development Plan, 2022-2027,
- iii. DEAT – Guidelines for Development of IWMP, 2012

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1. DEFINITIONS

Buy-back Centre- means a location where discarded materials can be exchanged for money for further transportation to a recycling facility. The price for the waste is determined by the current markets and the quantities of waste.

Disposal -means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto any land.

Domestic solid waste (General Waste) -is solid waste generated by single or multifamily residential dwellings, and solid waste of a non-hazardous nature, generated by wholesale, retail, institutional or service establishments such as office buildings, stores, markets, restaurants, theatres, hotels, warehouses, industrial operations and manufacturing processes.

Hazardous waste -is any waste, which by reason of chemical reactivity or toxic, explosive, corrosive or other characteristics causes danger or is likely to cause danger to human health or the environment, whether alone or in combination with other wastes. Hazardous waste is categorized in four hazard ratings with 1 being the most hazardous and 4 being the least hazardous.

Incineration- is the controlled combustion of solid waste employing closed combustion chambers, controlled combustion air, temperature monitoring and control to insure complete combustion of organic matter with a minimum of undesirable air emissions and wastewater discharges.

Medical waste -is any waste generated by hospitals, clinics, nursing homes, doctor's offices, Medical laboratories, research facilities and veterinarians, which are infectious or potentially infectious.

Peri urban -are areas that are adjacent to town and township

Recycling- is the sorting, processing, and transportation of solid waste materials, products or containers for the purpose of remanufacturing or reusing

Scavenging- is the unauthorized separation of solid waste for recyclable materials and for human consumption

Solid Waste- is waste of a solid nature generated by a person, business or industry

Solid Waste Management Facility- is any facility used for the transportation, processing, disposal of solid waste, and includes transfer stations, recycling facilities, composting facilities, waste incinerators, and sanitary landfills.

Sorting- is the authorized separation of solid waste materials for the purpose of recycling or disposal, either at the source of generation or at solid waste management facility.

Transfer Station- is a facility that receives solid waste from collection vehicles and reloads the waste into larger vehicles for transport to a disposal or processing facility.

Treatment -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, in order to minimize the impact of the waste on the environment prior to further use or disposal.

Waste Minimization - means techniques used to keep waste generation at a minimum level in order to divert materials from landfill. The term waste minimization is also applied to recycling and other efforts to reduce the amount of waste going into the waste stream.

Waste- means any substance, whether or not that substance can be reduced, re-used, recycled and recovered:

- a) That is surplus, unwanted, rejected, discarded, abandoned or disposed off
- b) Which the generator has no further use of for the purposes of production
- c) That must be treated or disposed off, or

ABBREVIATIONS

DEA – Department of Environmental Affairs/**DFFE** – Department of Forestry Fisheries and Environment

DWS – Department of Water and Sanitation

ECA – Environmental Conservation Act, Act No. 73 of 1989

IWMP – Integrated Waste Management Plan

ELM – Emalahleni Local Municipality

NEMA – National Environmental Management Act, Act No. 107 of 1998

NEMWA – National Environmental Management Waste Act, Act No. 59 of 2008

SDA – Service Delivery Areas

DARLEA – Department of Agriculture, Rural, Land and Environmental Affairs.

2. DEFINING THE GEOGRAPHICAL AREA

The Emalahleni Municipal area, which means the “place of coal”, consists inter alia of the towns of eMalahleni, Kwa-Guqa, Ga-Nala and Ogies. The town of eMalahleni was established in 1903. It was named after a ridge of white rock located near the present railway station. In the early years, this ridge was a halting place for transport wagons and a trading post. eMalahleni has a large collection of heritage assets, which is currently under threat from rapid development. Emalahleni is probably the most industrialized municipal area in Nkangala District and its landscape features mainly underground and opencast coalmines. The area has the largest concentration of power stations in the country. Its mining and industrial history is reflected in the area’s heritage places. This includes elements of industrial history, military history, architectural/engineering and graves which should be protected and conserved. Emalahleni Local Municipality is strategically located within the Mpumalanga Province and is situated in the jurisdictional area of the Nkangala District Municipality. The district is located to the North-West of the province and is the smallest district in land mass (21%) and has the second largest population concentration (35%) in the province. It covers an area of about 2677.67 km² in extent.

The Nkangala District Municipality is made up of six local municipalities, namely:

- Emalahleni Local Municipality
- Emakhazeni Local Municipality,
- Steve Tshwete Local Municipality,
- Thembisile Hani Local Municipality,
- Dr JS Moroka Local Municipality, and
- Victor Khanye Local Municipality.

Due to its strategic location within the Province it serves the function of a gateway municipality to eight of the nine provinces of South Africa (IDP, 2018-22). Its proximity to the Johannesburg, Ekurhuleni and the Tshwane Metropolitan Municipalities, which jointly constitute the largest economy in the country serve the municipality favorably. The road infrastructure connecting Emalahleni to the rest of the country is also very well maintained and used by logistic freight activities. Connecting the municipality to the rest of the country is the significant road infrastructure consisting of the N4 and N12 freeways. The N4 and the N12 converge at eMalahleni town to

continue as N4 free way that proceed to Nelspruit and Maputo. Running parallel to the N4 is a rail line that connects Gauteng through eMalahleni to Maputo. This significant rail and road infrastructure have been identified as part a Southern African initiative to connect Walvis Bay (on the west coast of Africa) and Maputo (on the east coast of Africa) called the Maputo Corridor. These significant transportation and freight linkages are critical to ensure improved trade between Namibia, Botswana, South Africa and Mozambique. The roads to the south of the municipality and rail connections connect eMalahleni to Richards bay and Maputo Harbour; this provides significant logistic opportunities for the coal that need to be exported through the harbours.

The southern areas of the Emalahleni Municipality form part of the region referred to as the Energy Mecca of South Africa, due to rich deposits of coal reserves and power stations such as Kendal, Matla, Duvha and Ga-Nala, while the new Kusile power station is located a few kilometres to the east of Phola.

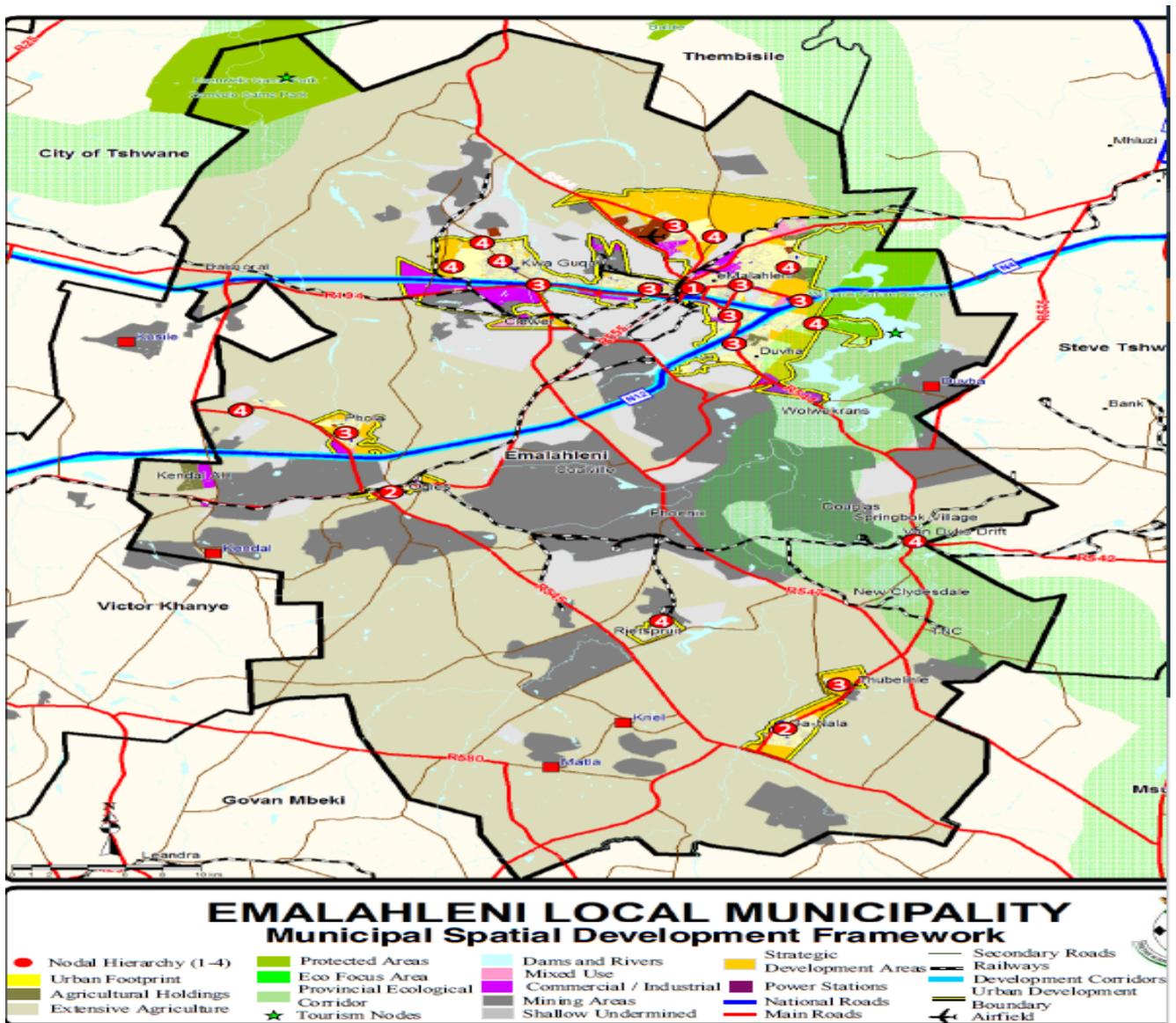
The eMalahleni Municipality area of jurisdiction consists of the following main towns/ settlements, ranked according to population: • eMalahleni complex; • Ogies and Phola; • Ga-Nala and Thubelihle; • Rietspruit; • Van Dyksdrift; and • Wilge. Emalahleni Local Municipality (ELM) as with all other municipalities in the country it has deep spatial challenges of the past where communities continue to live separately from each other, although strides have been made to bring the poor communities closer to centers of economic activities, land availability continues to hamstrung the programme. The following are the main service centers of the municipality:

- **Emalahleni:** Emalahleni is situated on the coordinates -25.890632. 29. 225845 and is 646 meters above sea level.
- **Ogies (Phola):** Ogies is situated on portion 43, a portion of portion 22 of the farm Ogiesfontein. Phola is located on portion 11 of Erf 1058 in the township of Phola. Ogies (Phola) is situated on coordinates -26.001397. 29.035419.
- **Ga-Nala (Kriel):** Ga-Nala is situated on Portion 5 of the farm Kriel 73-15, and its coordinates are -26.256216. 29. 269308.

The municipality Emalahleni Local Municipality is a major economic hub in the in the Mpumalanga Province with an estimated population growth of 3.5 % per annum. It has 64 wards and approximately 23% of the total households in the municipality are informal dwellings which have doubled since the 2011 Census. The municipality is predominantly rural, with very high levels of unemployment, inequality and poverty, the major economic activities include agriculture, manufacturing, mining and community services.

In as much as the municipality is striving to provide 100% of households with access to waste collection services, there are still challenges experienced with the provision of these services especially to informal dwellers. This ultimately contributes to challenges such as limited landfill site airspace and increased illegal dumping. The situation with illegal dumping has resulted in the development of the waste management by-laws and other relevant municipal by-laws which are aimed at curbing illegal dumping. There has been a rapid increase in the quantities of waste generated since 2008 as the municipality is growing in leaps and bounds due to its industrialization.

Figure 1: Locality map of the municipality



(Source: ELM Spatial Development Framework, 2016)

3. SITUATION ANALYSIS

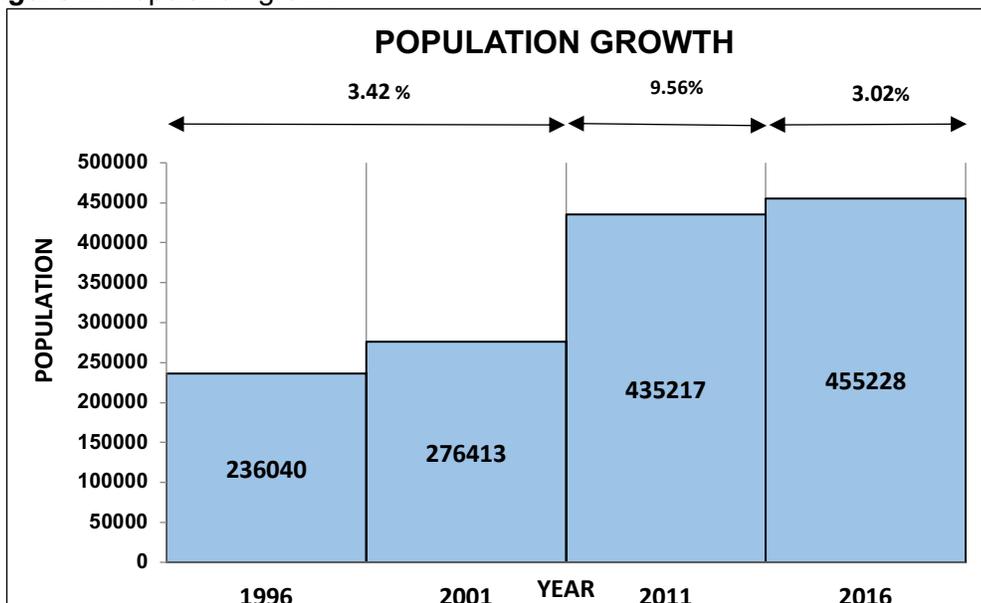
Demographics (Population and development profiles)

The information contained within this chapter is a summary of population demographics obtained from the most recent available ELM IDP (IDP 2022-2027), Stats SA Census (2011), and the Stats SA Community Survey (2016). Only data directly related to waste management has been included.

3.1.1. Base Population

The total population in ELM as determined by the Community Survey in 2016 was 455 228. The population growth since 1996 as reported by Stats SA (2011 and 2016) is shown in **figure 2 below**.

Figure 2: Population growth



(Source: Stats SA, 2016)

The population growth rates as depicted in Figure 2: Population growth indicate that:

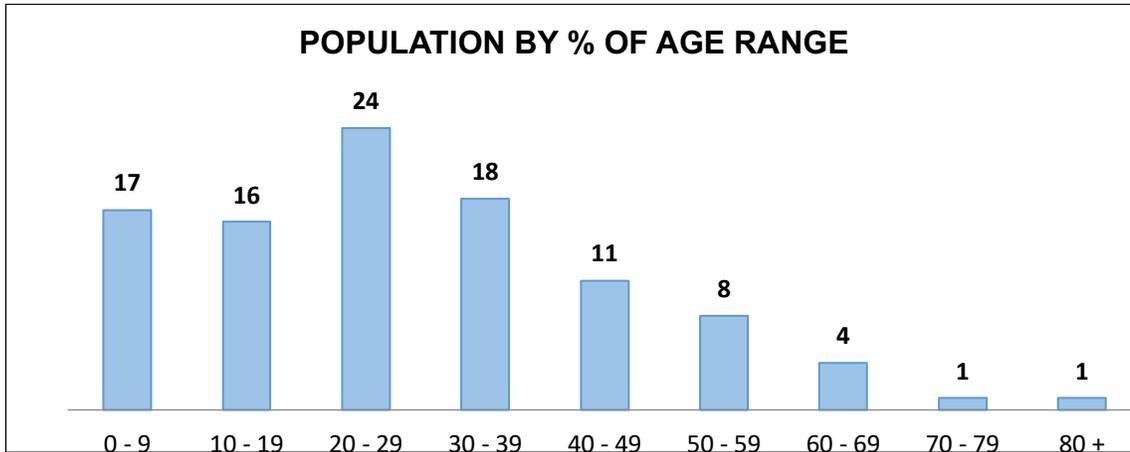
- between 1996 and 2001 the ELM population grew by 3.42 %.
- between 2001 and 2011 the ELM population grew by 9.56%
- between 2011 and 2016 the ELM population grew by 3.02 %

Based on these historical population growth rates, the estimated population of the ELM by 2030 will be 707 530 (IDP, 2018).

3.1.2. Age distribution

The age distribution of the ELM population as at 2016 is presented in below.

Figure 3: Population by age group



(Source: Stats SA, 2016)

57% of the population is considered young i.e. falling within the 0-29-year age category. The 60 year plus category consists of a small number of individuals constituting 6%. 61% of the population is of working age.

3.1.3. Household Characterisation

The number of households in the ELM between 1996 and 2016 is summarised in **Table 1**

Table 1: No. of Households

Year	1996	2001	2007	2011	2016
Total No. of Households	56 349	82 298	105 592	119 874	150 420

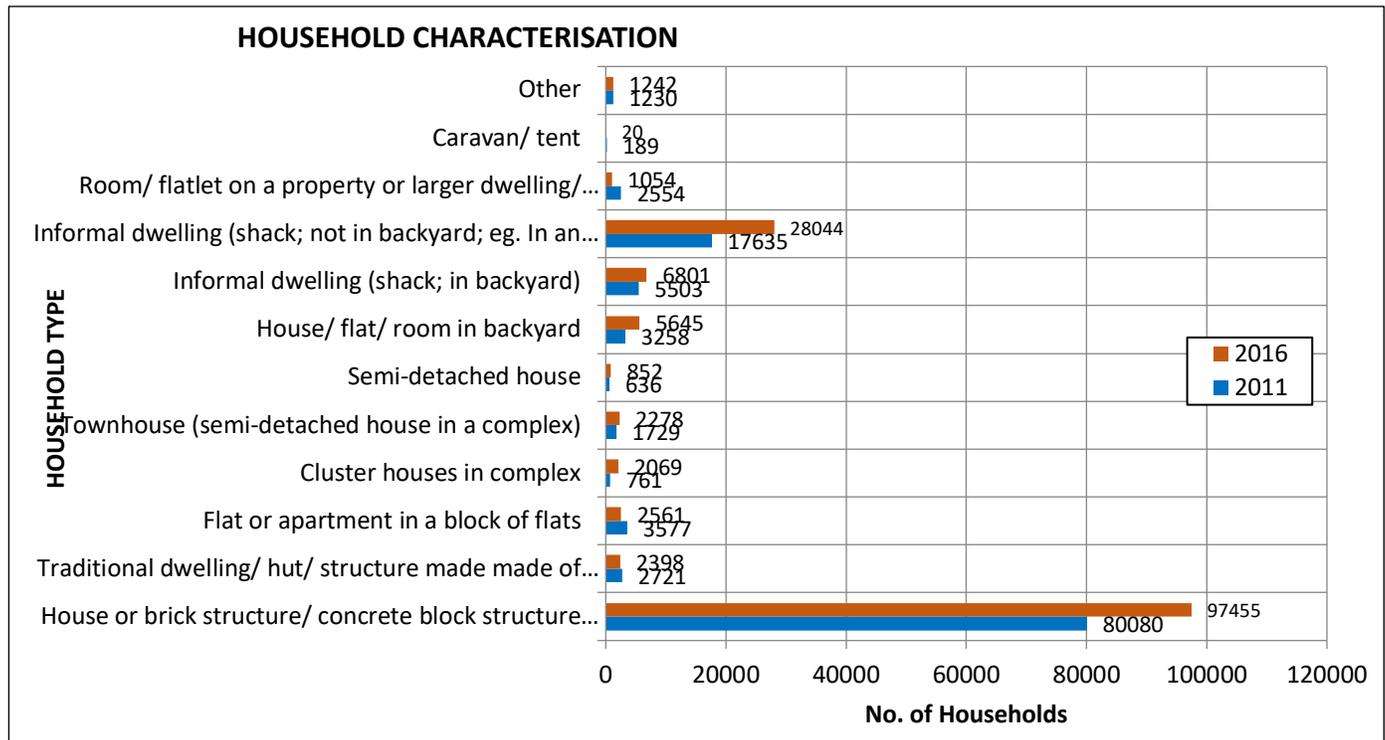
(Source: Stats SA, 2016)

In a 20-year period, the number of households in the ELM has increased by 94 000.

The figure below represents a breakdown of household type comparing the changes between 2011 and 2016. This data shows that there has been an increase of 11 700 informal households and an increase of 21 800 formal households over the 5-year period. The stats show evidence of the current trends of household/living preferences within ELM. The percentage of the population living in the different types

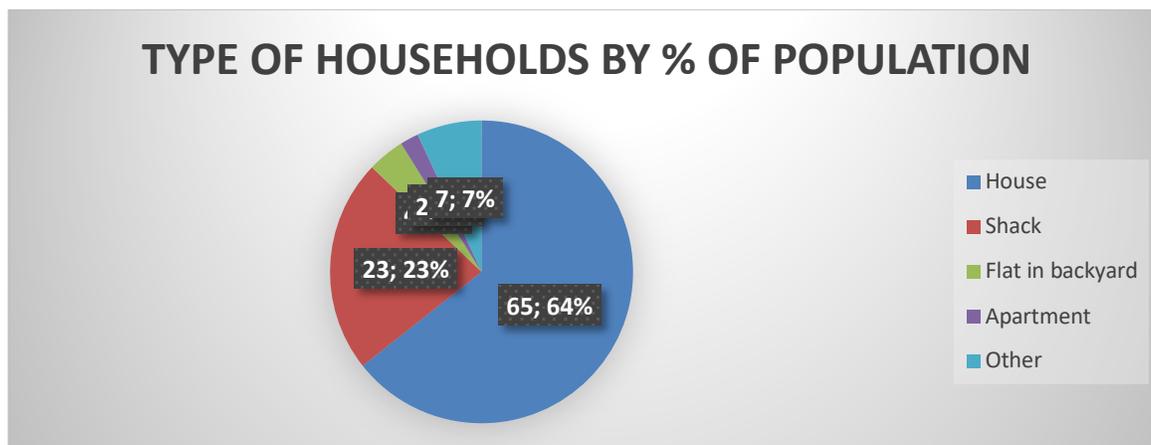
of households is presented in the figure below. Based on the information presented in **Error! Reference source not found.** 4, 71% of the ELM population lives in formalised residences while 23% of the population live in informal residences.

Figure 4: Household type’s vis-à-vis population



(Source: Stats SA, 2016)

Figure 5: Percentage of people living in different types of households



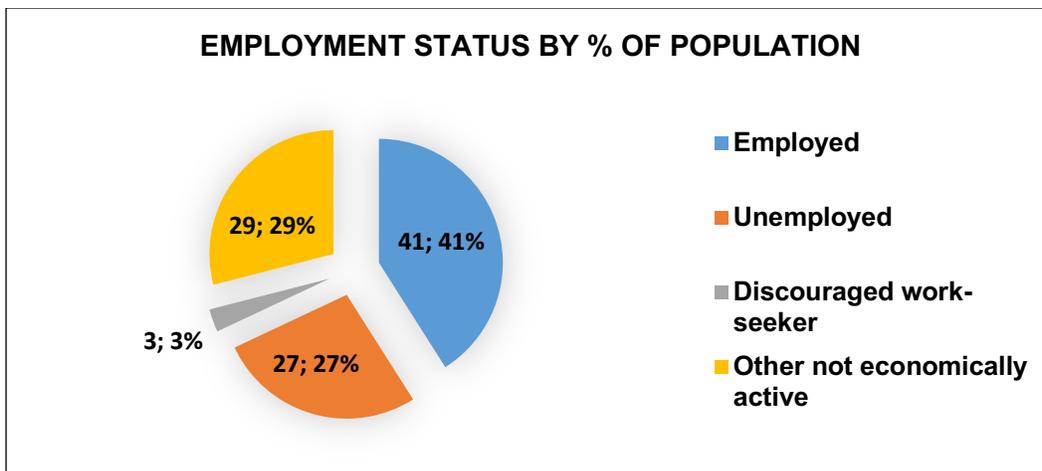
(Source: Stats SA, 2016)

3.1.4. Income and Employment Profile

The employment information presented in the figure below was extracted from Stats SA using the Census (2011) survey being the most up to date statistical information, as the 2016 Community Survey did not include employment status.

29% of ELM population are not economically active and 27% are unemployed. This suggests a relatively high dependency on the economically active population. The dependency ratio has however, reduced from 40.4% in 2011 to 37.9% in 2016. Unemployment in the municipal area is slightly above the national average (27.5%).

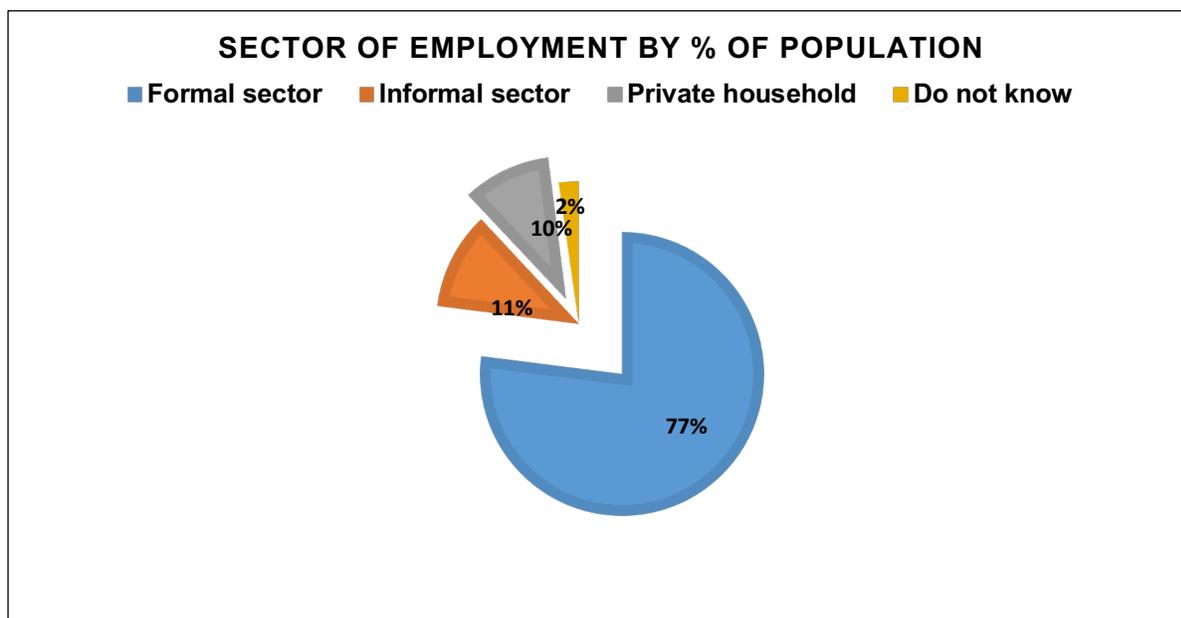
Figure 6: Employment status of population in percentage



(Source: Stats SA, 2011)

Based on the data presented in the figure below, 77 % of people in ELM's workforce work in the formal sector while 11% work in the informal sector. 10% and 2% of the workforce work in private households and unknown employment sectors respectively.

Figure 7: Sectors of employment by percentage 13.5% of the ELM do not earn income while 8.2% earn less than R9, 600-00 per month.



(Source: Stats SA, 2011)

Table 2: Annual household income (Census, 2011)

Monthly Income Range	% of Total Population
No Income	13.5
R1 - R4,800	3.2
R4,801 - R9,600	5
R9,601 - R19,600	11.1
R19,601 - R38,200	16.8
R38,201 - R76,400	17.5
R76,401 - R153,800	13.5
R153,801 - R307,600	10.5
R307,601 - R614,400	6.1
R614,001 - R1,228,800	2
R1,228,801 - R2,457,600	0.5
R2,457,601+	0.3

(Source: Stats SA, 2011)

4. DETERMINING CURRENT WASTE GENERATION AND ESTIMATING FUTURE WASTE GENERATION RATES AND QUANTITIES

According to South Africa State of Waste Report 2017, South Africa handled an estimated 55.6 million tonnes of general waste in 2017. The largest contribution to the total quantity of general waste was organic waste at 34.6%, which comprises predominantly biomass from sugar mills, sawmills, and the paper and pulp industry (DEA, 2018). Furthermore, the report states that 34.5% was recycled or recovered, 0.1% was treated, and 65.2% was disposed to landfill.

4.1. Estimated Waste Generation in the municipality

It is also important to estimate waste generated within the ELM in order to determine if current waste collection and disposal management and infrastructure are effective. Due to lack of accurate information on waste generation rates within the municipality, generic waste generation rates were used. Determination of the waste generation rates was based on the monthly average income (refer to table 2), population growth rate of 3.02% in figure 2 as per Community Survey 2016 and the waste generation rates per income level. Other sources of information on waste generation rates per income category can be obtained from; the South Africa Environment Outlook Report 2006, Department of Environmental Affairs and Tourism, the Minimum Requirements for Waste Disposal by Landfill” (2nd Edition, 1998); IWMP Guidelines, Department of Environmental Affairs and Tourism, 2009.

Using the different waste generation rates information sources, estimation of waste generations per income category for 2016 onwards was modelled as follows;

Table 3: Summary of Domestic Waste Generation Rates per Income Category

INCOME TYPE	DOMESTIC WASTE GENERATION RATES (kg/person/day)			
	<i>State of the Environment Report</i>	<i>Minimum Requirements</i>	<i>DEAT IWMP (unpublished)</i>	<i>Estimated for 2016 onwards</i>
Low	0.41	0.5	0.2 to 0.7	0.55
Middle	0.74	0.5	0.7 to 1.9	0.74
High	1.29	Up to 3.5	1.5 to 3.0	1.29

(Source: Section 78 study on ELM Solid Waste Management, 2020)

It is however unfortunately that none of the above references' sources define the income ranges for low, middle- or high-income categories in order to project future waste generation. Therefore, using the definitions contained in "Income Dynamics and Poverty Status of Households in South Africa" produced by Statistics South Africa, 2015, an allocation of associated income categories was done to forecast future waste generation.

Table 4: Categorized Income Types

MONTHLY INCOME RANGE	PERCENTAGE OF TOTAL POPULATION	PERSONS	CATEGORIZED INCOME TYPE
No Income	13.5	61,456	LOW
R1 - R4,800	3.2	14,567	LOW
R4,801 - R9,600	5	22,761	LOW
R9,601 - R19,600	11.1	50,530	LOW
R19,601 - R38,200	16.8	76,478	LOW
R38,201 - R76,4000	17.5	79,665	LOW
R76,401 - R153,800	13.5	61,456	MEDIUM
R153,801 - R307,600	10.5	47,799	MEDIUM
R307,601 - R614,400	6.1	27,769	MEDIUM
R614,001 - R1,228,800	2	9,105	MEDIUM/HIGH
R1,228,801 - R2,457,600	0.5	2,276	HIGH
R2,457,601+	0.3	1,366	HIGH

(Source: Section 78 study on ELM Solid Waste Management, 2020)

Flowing from the income categories in Table 4, the amalgamation of population ratios per categorized income type with the population growth statistics that were published in the Community Survey 2016 resulted in the determination of the estimated yearly waste generation quantities. Due to the positive population growth associated with Emalahleni Local Municipality, it is forecasted that the amount of waste being generated will increase yearly as illustrated in the table below.

Table 5: Estimated Current and Future Waste Generation Quantities

YEAR	POPULATION	ESTIMATED FUTURE AMOUNT OF DOMESTIC WASTE GENERATED (tons)
2016	455 228	87 810
2017	468,976	90 461
2018	483,139	93 193

2019	497,730	96 008
2020	512,761	98 907
2021	528,247	101 894
2022	544,200	104 972
2023	560,634	108 142
2024	577,566	111 408
2025	595,008	114 772

(Source: Section 78 study on Emalahleni Solid Waste Management, 2020)

Assumptions made to formulate the waste forecast model include the following:

- The population ratio with regards to the monthly income range will remain constant over this time period;
- The growth rate will remain constant over this forecast period.
- Estimation of the total amount of General Waste generated in ELM does not consider reclamation of waste via recycling as well as waste generated from commercial and industrial sources.

4.2 Waste Quantities and Types

4.2.1 General Waste

Annexure 1 of the Waste Classification and Management Regulations (R 634, August 2013) lists different types of waste that fall within the General Waste Category, this includes the following: Domestic waste; business waste not containing hazardous waste or hazardous chemicals; Non-infectious animal carcasses; garden waste; waste packaging; waste tyres; building and demolition waste not containing hazardous waste or hazardous chemicals and excavated earth material not containing hazardous waste or hazardous chemicals.

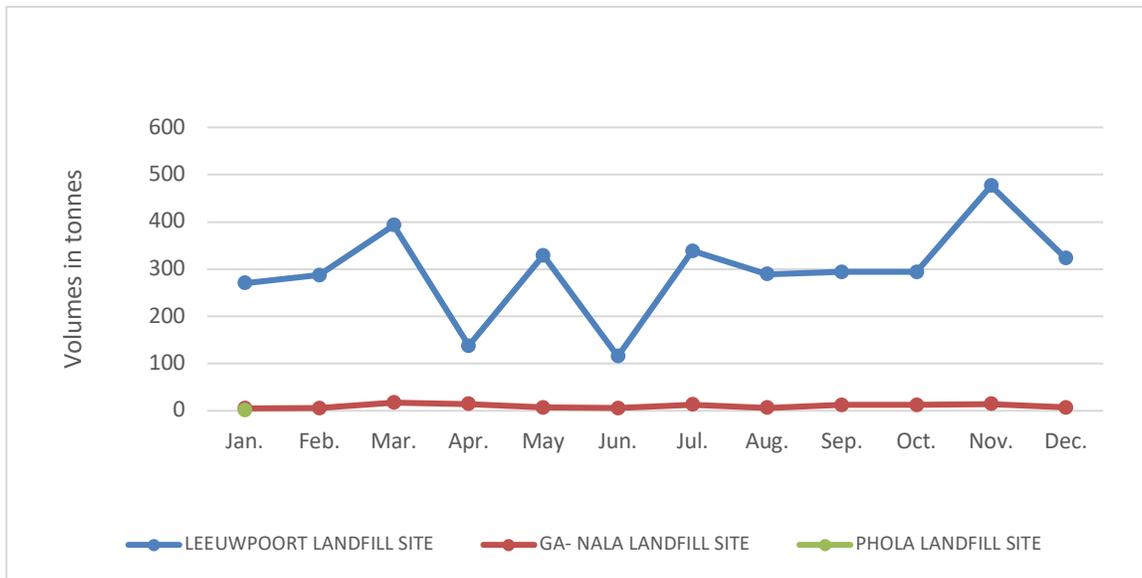
Quantification of General Waste collected in the ELM was based on the monthly datasets that were sourced from Emalahleni Local Municipality's Environmental and Waste Management Directorate. This data contains monthly waste quantities over a period of 2 years (2016 – 2017) as reflected in Table 8 below.

ELM currently operates 3 landfill sites which are Ga-Nala (25 ha), Leeupoort (55 ha) and Phola (11.91 ha). None of these landfills utilize weighbridge facilities to record waste quantities entering the site. Currently waste entering the site is logged via the type of vehicle and estimate of the volume of the load.

Table 6: Total volumes of waste received in all three landfills during the year 2021

MONTHS	LEE UWPOORT LANDFILL SITE	GA- NALA LANDFILL SITE	PHOLA LANDFILL SITE	
Jan.	5652,3	772,8	1320,8	
Feb.	8542,45	900,05	900,05	
Mar.	9608,7	1288,75	851,2	
Apr.	8697,15	894,1	588,55	
May	6706,9	1173,1	492,45	
Jun.	6015	989,6	557,85	
Jul.	6736,75	1032,45	341	
Aug.	5093,05	942,25	308,95	
Sep.	9270,6	1215,8	480,5	
Oct.	6826,1	955,5	419,65	
Nov.	6914,65	1231,55	480,15	
Dec.	4279,65	580,2	463,9	
TOTAL:	84 343,3	11 976,15	7 205,05	103 524,50

Figure 8: Graphical representation of total volume of waste received at all landfills during the year 2021



ELM records of waste entering landfills into the different categories as presented in the table below.

Table 7: ELM Waste Categories received at all three landfill sites.

WASTE CATEGORY	DESCRIPTION
COMMERCIAL / INDUSTRIAL	Commercial and industrial waste (non-hazardous) that is collected by ELM, including subcontractors
GARDEN	Discarded plant/tree trimmings, grass cuttings, tree branches and trunks
INERT	Discarded non-hazardous material that originated from building or demolishing projects. Includes fragmented concrete, broken bricks and blocks
MUNICIPAL	Domestic waste collected by ELM

4..2. Landfill sites

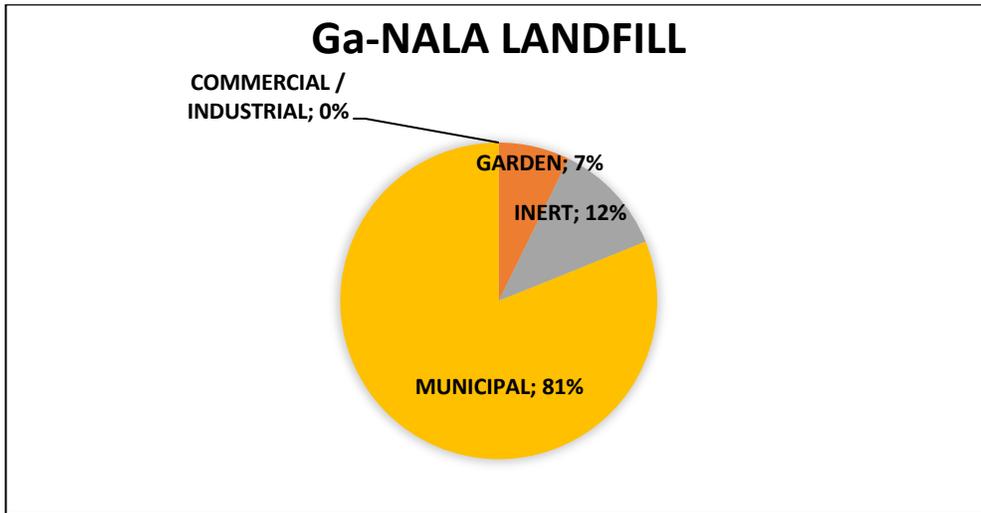
General waste is disposed of at three permitted general waste landfills located within the ELM area. The waste data related to each of these landfills is presented as follows:

(a) Ga-Nala Landfill

A fully-fledged weighbridge which was funded by Exxarro coal mine was installed at Ga-Nala landfill, unfortunately the weighbridge is currently not functional due to theft and vandalism of IT equipment. Estimates of waste volumes received on site are done on a daily basis.

The tonnages of waste disposed of at this facility are increasing annually. Municipal waste accounts for majority of the waste that is being disposed of at this landfill.

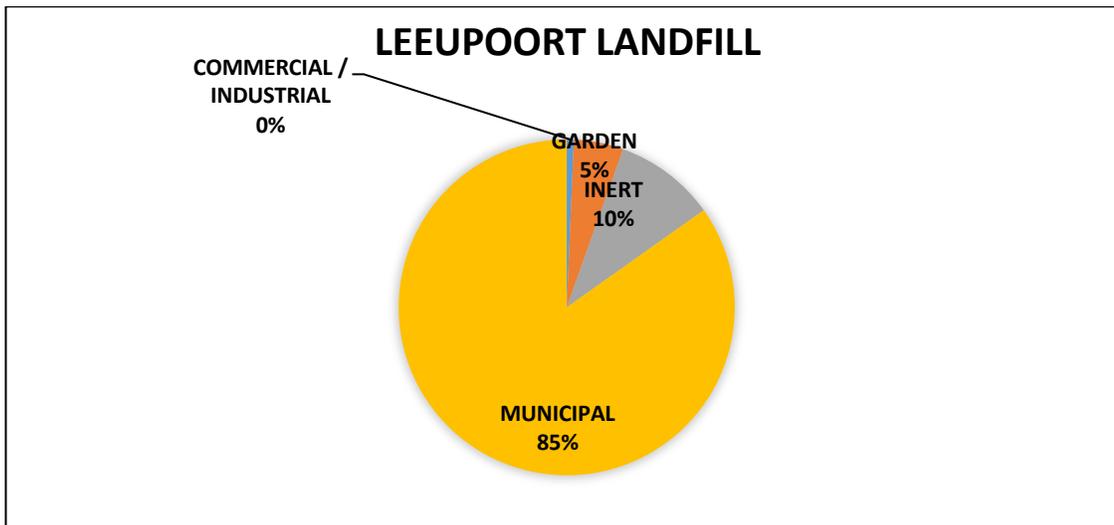
Figure 9 Error! Reference source not found.: Percentage breakdown of waste types disposed of at Ga-Nala Landfill



(b) Leeuwoort Landfill

Leeuwoort landfill does not have a weighbridge. A budget has been allocated for the installation of a weighbridge during the 2021/2022 financial year. Estimates of waste volumes received on site are done on a daily basis. The tonnages of waste disposed of at this facility are increasing. Municipal waste accounts for majority of the waste that is being disposed of at this landfill.

Figure 10: Percentage breakdown of the waste types disposed of at Leeuwoort Landfill



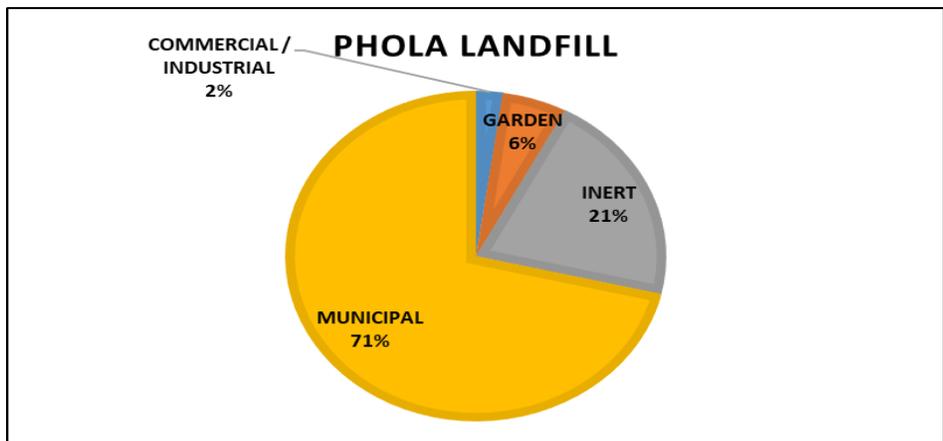
(c) Phola Landfill

A fully fledged weighbridge was installed for Phola landfill, unfortunately due to lack of security on site, the weighbridge was vandalised and eventually stolen. The weighbridge was funded by Glencore coal

mine. The tonnages of waste disposed of at this facility are increasing by 2%. Municipal waste accounts for majority of the waste that is being disposed of at this landfill.

Percentage breakdown of the waste types disposed of at Phola Landfill during 2016 and 2017 is shown in below;

Figure 11: Percentage breakdown of waste types received at Phola Landfill



(d) Combined Landfill Statistics

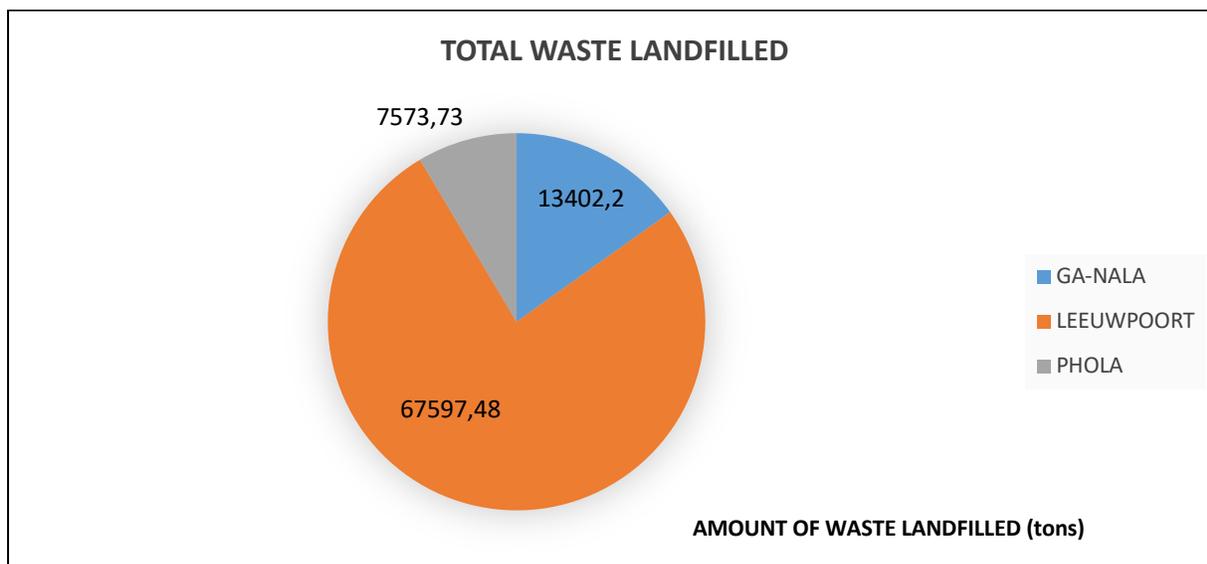
The table below presents a combination of the quantities of waste disposed of at all the ELM landfills. Notably there was a 4% increase from 2016 to 2017. In 2017, 84% of waste disposed of at these landfills was general municipal waste.

Table 8: Combined Waste Quantities Received at ELM Landfill Sites

Waste Categories	Waste Quantities (tons)	
	2016	2017
COMMERCIAL / INDUSTRIAL	769.44	473.74
GARDEN	4324.83	4694.38
INERT	9976.3	9040.06
MUNICIPAL	69648.23	74365.23
TOTAL	84718.8	88573.41

The percentage breakdown of the waste landfilled at each of the landfill sites during 2017 is shown in the diagram below.

Figure 12: Total percentage of waste disposed per landfilled

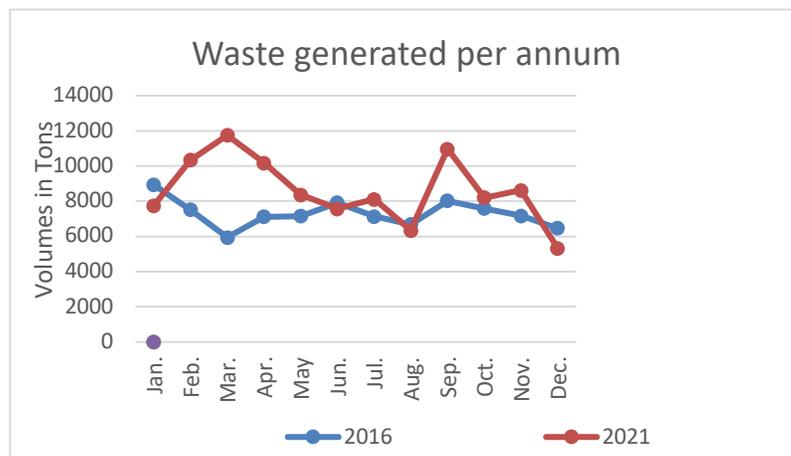


A cross tabulation of waste disposed of during 2016 and 2021 across all three landfills

Table 9: Cross tabulation of generated waste per month in the years 2016 and 2021

MONTHS	2016	2021
Jan.	8932	7745,9
Feb.	7524,5	10342,55
Mar.	5948,3	11748,65
Apr.	7120	10179,8
May	7157,1	8372,45
Jun.	7911,6	7562,45
Jul.	7136,2	8110,2
Aug.	6688,2	6344,25
Sep.	8015,7	10966,9
Oct.	7581,6	8201,25
Nov.	7165,44	8626,35
Dec.	6469,6	5323,75

Figure 11: Graphical presentation of waste generation during 2016 and 2021



TOTAL: 87 650,24 103 524,50

A review of the combined waste quantities illustrates that there is an increase in the amount of waste being landfilled. This is a negative aspect with regards to waste management as landfilling of waste is the least favorable option in the waste management hierarchy.

The estimated total municipal waste generated as calculated for 2016 was 87 650.24 tons. When this is compared to the 103 524.50 tons of municipal waste disposed of in 2021, this indicates an increase of approximately 16 000 tons of municipal waste collected and disposed of. Note this is an indication only as neither the waste generation model nor the waste disposal data is accurate, and thus this should

be considered as an order of magnitude estimate only. Further discussion in the forthcoming paragraphs indicate that issues such as inadequate maintenance of the collection vehicle fleet and illegal dumping will ultimately corroborate this difference.

4..3. Hazardous Waste

NEMWA defines hazardous waste as waste that contains organic or inorganic elements or compounds that can have detrimental impacts on health and the environment. Hazardous waste includes health care waste, e-waste, fluorescent lamps, batteries, waste that contains polychlorinated biphenyls (PCBS), pesticide waste, oil, asbestos, and sewage sludge. At a domestic level hazardous waste can include discarded detergent containers and household pesticides etc. Commercial, industrial and mining sector hazardous waste is handled by private sector waste management companies in the ELM. Most of the hazardous waste generated in the ELM is disposed of at Rietfontein Springs Hazardous Landfill by private waste contractors.

Due to inadequate access control at all landfills within ELM, it is possible that hazardous waste has been disposed of at the three ELM landfills. Examples of hazardous wastes illegally ending up in general waste landfills are healthcare waste from local clinics, small quantities of paints, solvents, batteries and other household hazardous wastes.

It is crucial that all landfills improve access control in order to prevent the disposal of hazardous waste into these landfills.

4..4. Mining Waste

General waste from mining companies is collected and transported by private waste contractors and disposed of at the ELM landfills. These wastes are recorded by the ELM landfills in the industrial / commercial waste category.

Residue mine stockpiles are managed internally by the mines, and any hazardous waste is transported by private contractors for treatment and disposal at the Rietfontein Springs Hazardous Landfill.

5. WASTE STREAM ANALYSIS

5.1. A waste stream analysis for all waste collected in 2022 is outlined in the tables below.

Table 10: Waste types and percentage

Waste type/streams	Waste generated per annum (tons)	Total percentages
Domestic waste	69 006	64.3 %
Organic waste	3 519.20	3.3 %
Construction and demolition waste	30 849.05	29 %
Commercial & industrial	287.55	3 %
Tyres	0	0 %
Other (Recyclable materials: glass, metal, paper, plastic etc)	3 673.75	3.4 %
Total	107 335.06	100

5.2. Volume density estimation of waste per landfill site

Table 11: Volume density percentages for waste disposed of at Leeuwpoot landfill

<i>Leeuwpoot Landfil site</i>		
Waste type/streams	Waste generated per annum (tons)	Total percentages
Organic waste	70	36.0825 %
Cans	15	7.73196 %
Paper	19	9.79381 %
Glass	30	15.4639 %
Plastic	10	5.15464 %
Construction demolition waste	50	25.7732 %
Tyres	0	0 %
Other	0	0 %
Total		100 %

Table 12: Volume density percentages for waste disposed of at Ga-Nala and Phola landfills

<i>GaNala and Phola Landfills</i>		
Waste type/streams	Waste generated per annum (tons)	Total percentages

Organic waste	15	34.0909 %
Cans	8	18.1818 %
Paper	4	9.09091 %
Glass	4	9.09091 %
Plastic	7	15.9091 %
Construction and demolition waste	5	11.3636 %
Tyres	1	2.27273 %
Other	0	0 %
Total		100 %

5.3 Waste Recycling

ELM does not undertake any direct recycling operations, but rather promotes and co-ordinates commercial recycling initiatives in the ELM area. As such, there are no significant capital developments required by ELM, and minimal annual operating costs that are already accounted for elsewhere.

Recycling within the ELM is primarily undertaken by private organisations. There are eighteen (18) recycling facilities in Emalahleni Local Municipality as of 2022, of which 9 of the 10 registered facilities do not submit monthly statistics to the waste information officer of the municipality.

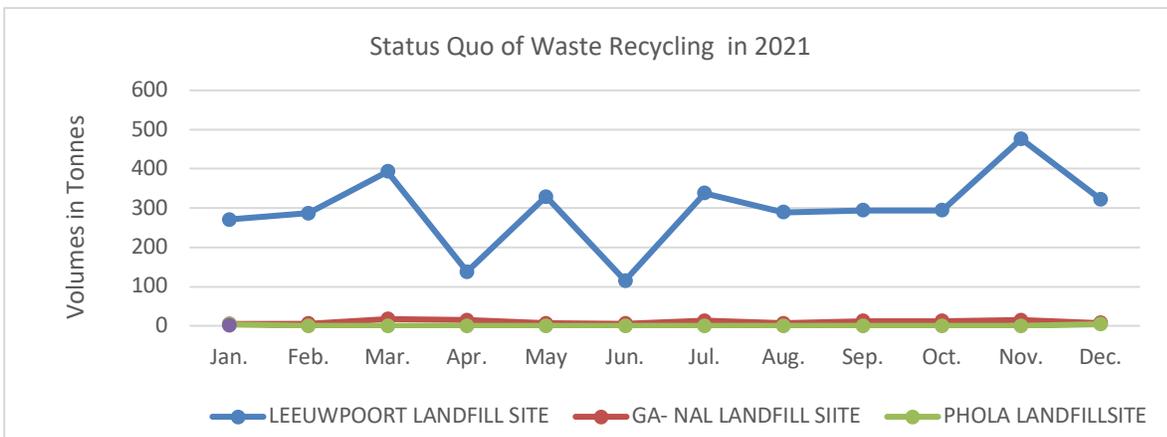
Therefore, statistics in possession is only for two facilities and will not give a true reflection of waste handled by recyclers within the municipality. According to records; waste handle in 2021 was 3673, 95 tons.

These organisations collect recyclable waste from commercial and mining companies. Reclaiming of recyclable material at all of ELM's landfills is a daily occurrence. The recyclable material that is extracted from the landfill by waste reclaimers is sold to private recycling companies. In most cases these individuals earn a living from selling recyclable material to private companies. Items that are recycled are paper, plastic, cardboard and metal.

Table: 13: Quantities of waste recycled during the period 2021 in tons

MONTHS	LEE UWPOORT LANDFILL SITE (Tonnes)	GA- NAL LANDFILL SIITE (Tonnes)	PHOLA LANDFILLSITE (Tonnes)
Jan.	270,4	4,9	3,59
Feb.	287,2	5,5	0
Mar.	393,31	17,2	0
Apr.	137,77	14,2	0
May	328,8	6,7	0
Jun.	115,3	5,4	0

Jul.	338,34	12,7	0	
Aug.	289,07	6,18	0	
Sep.	293,98	12,4	0	
Oct.	293,98	12,4	0	
Nov.	476,3	14,41	0	
Dec.	322,97	6,8	4,15	
TOTAL:	3547,42	118,79	7,74	3673,95



Examples of private and informal recycling operations within the ELM are presented in the following photos

Figure 12: Conditions under which waste pickers operate at all municipal landfills



Figure 13: Paper and Plastic packaged in bulk bags



Figure 14: Entrepreneurs transporting recycling material to a recycling company



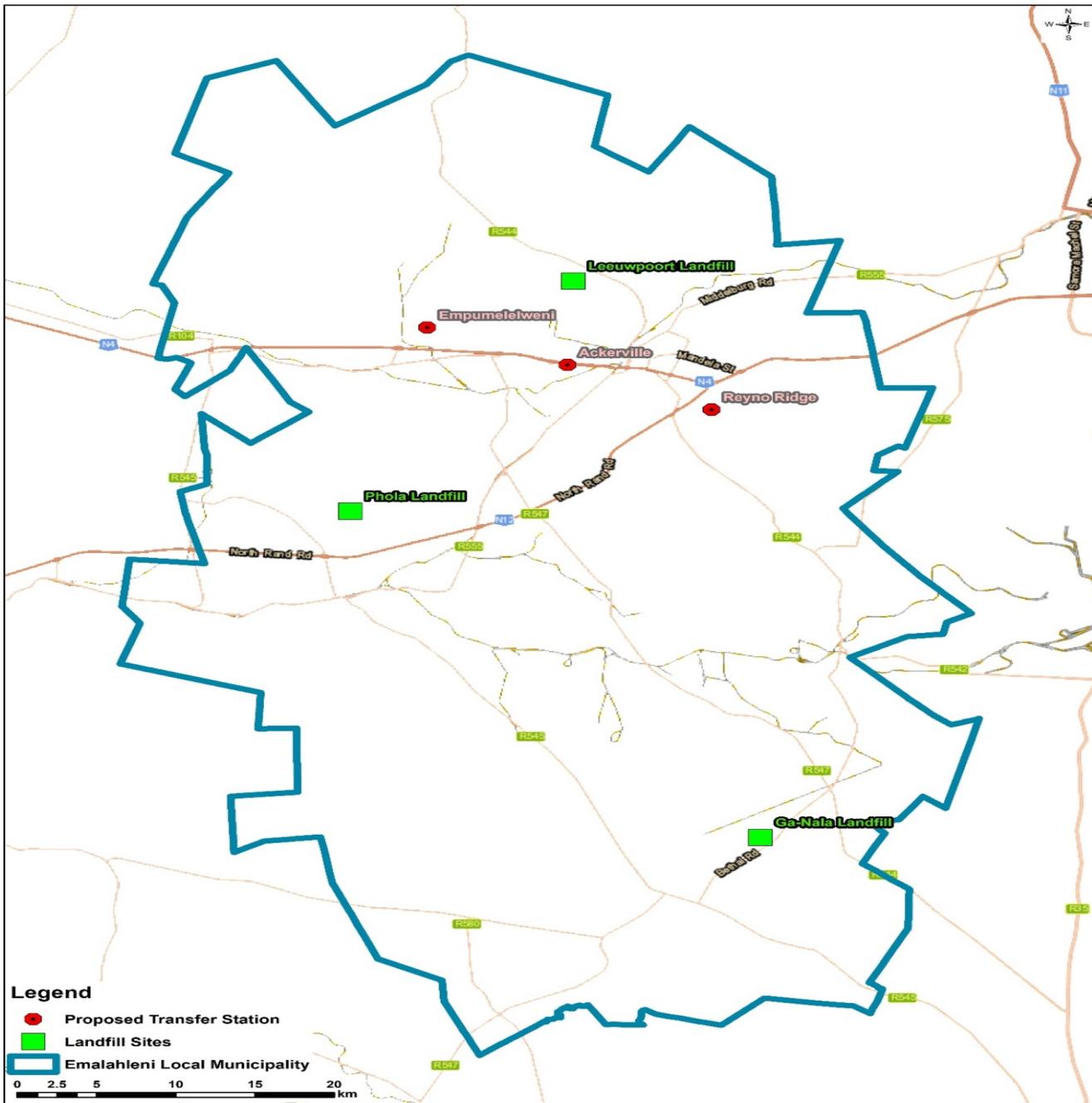
Table 14: Average prices paid for Recyclable Material in 2019

TYPE	PRICE (Per Kilogram)
Bottles	R0.50
Cans – Alu	R4.00
Cans – Non-Alu	R1.00
Cardboard	R0.90
Paper - White Only	R2.00
Paper - Mixed	R1.00
Plastic - Clear	R1.00
Plastic - Mixed	R0.50

11.1. Waste Transfer and recovery facility

ELM is currently in the process of finalising the construction of 2 x waste transfer and recovery stations in Reyno Ridge and Schoongesighct. A third waste transfer station and recovery station is planned for Empumelweni in KwaGuqa Extension. The intention of these mini waste transfer stations is to provide waste management services close to the residential areas in a manner that will also allow residents an opportunity to recycle and/or drop off recyclable materials and general waste not picked up by the municipal collection fleet. The two facilities under construction are funded by a local mine operating in the ELM. The **figure below** depicts the location of Landfills sites and Waste transfer and recovery facilities within Emalahleni Local Municipality;

Figure 15: Location of Proposed Waste Transfer Stations



11.1. Waste Disposal

Landfilling is the dominant process that is currently utilised by ELM to safely dispose of non-hazardous waste. ELM operates 3 landfills which are strategically located in different service areas (Northern Region – Leeuport Landfill, Central – Phola Landfill and Southern Region – Ga-Nala Landfill). All of these landfills have waste management licences. Currently all ELM landfills are operated and managed

by private landfill contractors. Generally, the current details and status of each of the three landfills are summarised as follows:

GA-NALA LANDFILL					
GPS CO-ORDINATE	29°16' 58.03"S 29° 16'58.03"E	PERMIT NO.	17/4/WP/MP312/14/0 1	CLASSIFICATION	G:S:B-
LANDFILL FOOTPRINT	24ha	REMAINING LIFESPAN	20 years	WASTE HANDLED TYPE	GENERAL
SURROUNDING LANDUSE	Located 200m from Thubelihle Settlement				
LANDFILL OPERATOR	Serviced by an external service provider.				
AREAS AND TRANSFER STATIONS SERVICED BY LANDFILL	All of Ga-Nala	NO. OF STAFF PRESENT ON SITE?	ELM Staff – 1 x Spotter, 1 x Data Capturer, Landfill supervisor		
SECURITY/ACCESS CONTROL?	Completely fenced off, boom gate access control, 1 security guard during the day and 2 guards at night	ODOUR/VERMIN CONTROL?	None		
WEIGHT BRIDGE	Weighbridge newly installed but not operationalised				
FIRE FIGHTING	Fire extinguishers locates around site, fire hose system in place, at landfill cell has sand stockpiles to extinguisher any fires				
VECHILES	Tipper Truck, Front End Loader and TLB				
WASTE HOLDING AREA PRESENT?	No	BACKUP GENERATOR?	No	WASTE RECLAIMERS PRESENT?	Yes
RECYCLING ACTIVITIES?	Some recyclable material removed by waste reclaimers				
ANNUAL AUDITS?	Not done	LEACHATE/GAS TREATMENT?	None		
STORMWATER MANAGEMENT?	Landfill has concrete v-drains, linked to a contaminated storm water catchment area, Leachate not treated.	WATER MONITORING?	None		
WASTE DISPOSAL PROCEDURE?	Waste is offloaded at cells, then spread/compact, finally cover material placed on cell (RAMP METHOD)				
SOURCE OF COVER MATERIAL	From site, non-contaminated building rubble also used as cover material.				

REHABILITATION	No evidence of rehabilitation found on site.
CURRENT CONSTRAINTS OF SITE	<ul style="list-style-type: none"> The Facility does not have portable water The Ablution facilities are in a poor state, require repairs to be undertaken Groundwater water monitoring not is occurring Compaction is only occurring occasionally not daily, no compactor on site. One compactor is shared amongst other disposal facilities Broken fences and gates need to repair, urgent need for improved access control, there are cases of hazardous waste entering landfill Weighbridge needs to be repaired, current method of logging waste is not accurate, ELM cannot bill client accurately.
FUTURE CONSTRAINTS OF SITE	This facility requires urgent intervention; limited compaction will reduce estimated lifespan of the landfill. A non-operational weighbridge results in inaccurate billing to clients ultimately ELM will lose revenue. Should access control not be improved then more hazardous material will enter the site and could result in fatal health issues for waste reclaimers.

LEEUPORT LANDFILL					
GPS CO-ORDINATE	25°49' 18.82"S 29° 10'34.66"E	PERMIT NO.	B33/2 210/32/P136	CLASSIFICATION	G:M:B-
LANDFILL FOOTPRINT	19Ha	REMAINING LIFESPAN (years)	1	WASTE TYPE HANDLED	Garden Refuse and Builders Rubble
LANDFILL OPERATOR	ELM has appointed a private contractor, Khabokhedi Waste Management, to operate this landfill.				
SURROUNDING LANDUSE	Informal settlements found opposite the site entrance. This community salvages recyclable material from the landfill.				
AREAS AND TRANSFER STATIONS SERVICED BY LANDFILL	All of Emalaheni (East and West)	NO. OF STAFF PRESENT ON SITE	ELM Staff – 1 x Spotter, 1 x Data Capturer, 1 x Operator Khabokhedi Staff – 3 x Spotters, 1 x Data Capturer, 3 x Operators, 1 x Supervisor		
SECURITY/ ACCESS CONTROL	Completely fenced off, boom gate access control, 2 security guard during the day and 2 guards at night	ODOUR/ VERMON CONTROL	None		
WEIGHT BRIDGE	None				
FIRE FIGHTING	Fire extinguishers locates around site, fire hose system in place, at landfill cell has sand stockpiles to extinguisher any fires				
VECHILES	Compactor, Excavator and ADT				

WASTE HOLDING AREA PRESENT?	No	BACKUP GENERATOR	No	WASTE RECLAIMERS PRESENT?	Yes
RECYCLING ACTIVITIES?	Some recyclable material removed by waste reclaimers				
ANNUAL AUDITS?	NO	LEACHATE/GAS TREATMENT	No		
STORMWATER MANAGEMENT?	No	WATER MONITORING	No		
WASTE DISPOSAL PROCEDURE?	Waste is offloaded at cells, then spread/compacted, finally cover material placed on cell (RAMP METHOD)				
SOURCE OF COVER MATERIAL	From Phase 2 developments, non-contaminated building rubble also used as cover material.				
REHABILITATION	No evidence of rehabilitation.				
CURRENT CONSTRAINTS OF SITE	<ul style="list-style-type: none"> • Groundwater water monitoring not is occurring • Overcrowding by waste reclaimers hampering daily operations • Presence of stray animals on site. • Broken fences and gates need to repair, urgent need for improved access control, there are cases of hazardous waste entering landfill 				
FUTURE CONSTRAINTS OF SITE	This facility has limited airspace available. ELM are designing Phase 2 Leeupoort Landfill. Because the site has no weighbridge facility it results in inaccurate billing to clients ultimately ELM will lose revenue. Should access control not be improved then more hazardous material will enter the site and could result in fatal health issues for waste reclaimers.				

PHOLA LANDFILL					
GPS CO-ORDINATE	25°59' 19.53"S 29° 02'59.25"E	PERMIT NO.	12/9/11/P135	CLASSIFICATION	G:C:B-
LANDFILL FOOTPRINT	12Ha	REMAINING LIFESPAN	11 years	WASTE TYPE HANDLED	GENERAL
SURROUNDING LANDUSE	500m from Phola Settlement				
LANDFILL OPERATOR	ELM has appointed a private contractor, Khabokhedi Waste Management, to operate this site.				
AREAS AND TRANSFER STATIONS SERVICED BY LANDFILL	All of Phola and Ogies	NO. OF STAFF PRESENT ON SITE?	ELM Staff – 1 x Spotter, 1 x Data Capturer, 1 x Operator Khabokhedi Staff – 1 x Spotter, 1 x Data Capturer, 2 x Operators		
SECURITY/ACCESS CONTROL?	Completely fenced off, boom gate access control, 1	ODOUR/VERMIN CONTROL?	No odour management system implemented, has vermin control measures		

	security guard during the day and 2 guards at night		
WEIGHT BRIDGE	Yes, but not operational		
FIRE FIGHTING	No		
VECHILES	Front End Loader, TLB and Tip Truck		
WASTE HOLDING AREA PRESENT?	No	BACKUP GENERATOR?	No
		WASTE RECLAIMERS PRESENT?	Yes
RECYCLING ACTIVITIES?	Some recyclable material removed by waste reclaimers		
ANNUAL AUDITS?	Yes	LEACHATE/GAS TREATMENT?	No
STORMWATER MANAGEMENT?	Landfill has concrete v-drains, linked to a contaminated storm water catchment area, does get treated	WATER MONITORING?	No
WASTE DISPOSAL PROCEDURE?	Waste is offloaded at cells, then spread/compact, finally cover material placed on cell (RAMP METHOD)		
SOURCE OF COVER MATERIAL	No compaction undertaken		
REHABILITATION	No rehabilitation evident		
CURRENT CONSTRAINTS OF SITE	<ul style="list-style-type: none"> • The Facility does not have portable water; • The facility does not have electricity; • The Ablution facilities are in a poor state, require repairs to be undertaken; • No office facilities for the contractor to utilise; • Groundwater water monitoring is not occurring; • Compaction is only occurring occasionally not daily, no compactor on site. 1 compactor is shared amongst other disposal facilities; • Broken fences and gates need to repair, urgent need for improved access control, there are cases of hazardous waste entering landfill 		
FUTURE CONSTRAINTS OF SITE	<p>This facility requires urgent intervention; no compaction will reduce estimated lifespan of the landfill. A non-operational weighbridge results in inaccurate billing to clients ultimately ELM will lose revenue. Should access control not be improved then more hazardous material will enter the site and could result in fatal health issues for waste reclaimers.</p>		

A review of the (internal) Control Environment Audit Report reveal the following negative management issues relating to these landfills:

- Unauthorised access. The repair of broken fences and gates will need to be prioritised as there have been reported instances that hazardous material is being disposed within these landfills.
- No compaction of waste or covering of waste at Phola Landfill. Landfilled waste that has not being compacted or covered with cover material can have detrimental effect to the environment and also severely limit the lifespan, especially for Phola Landfill. Proper landfill management off all sites must also be prioritised.
- Lack of groundwater boreholes and groundwater monitoring and therefore the impact of groundwater resources associated with these landfills is unknown. This must also be addressed going forward in order to be compliant with the Waste Management Licence.
- Lack of operational weighbridges and therefore no accurate record of waste quantities being disposed of.

11.1. Status Quo of Waste Treatment

ELM does not undertake any direct waste treatment operations, but rather promotes and encourages any feasible commercial waste treatment initiatives in the ELM area.

6. DOMESTIC WASTE COLLECTION

Approximately 82% of waste collected by the ELM is domestic and garden waste, while 5% of waste is from illegal dumping and 7% from the business sector.

Waste collection is a crucial phase of waste management. Poor waste collection systems can result in an exponential growth in illegal dumping as waste generators are often not willing to incur transportation costs and disposal charges to dispose of their waste appropriately. There are different types of waste generators in the ELM which are serviced by different waste collection systems.

68.1% have access to curbside refuse removal. An increase of 0.9% in 2021 - (102 829 households out of a total of 151 000).

ELM uses two system of waste collection, namely;

- Mass container removal system which is mainly targeting informal settlements and settlements which do not receive the service and
- Kerbside refuse collection system which targets the formal settlements as well as businesses.

6.1 MASS CONTAINER REFUSE REMOVAL SYSTEM

Un-serviced areas are provided with bulk 6m³ mass container waste removal service. Approximately 47.6 % of the households are provided with mass containers for waste removal services. ELM places skip bins at strategic locations within urban informal areas. The householders walk/drive to the skip bin to dispose of their waste. Remote formal and informal rural areas do not receive waste collection services by ELM. These households tend to burn or bury their waste. The Table below shows the informal and un-serviced settlements that are serviced through the mass container removal system.

Item	Total number	
Total Households (hh)	151000	
Serviced households (Curbside collection)	102829	
Un-serviced households	48171	
Indigent households	6354 (2022 Stats)	
Un-serviced indigent households	0	
Service Level A: On-site appropriate and regularly supervised disposal	0	
Service Level B: Community transfer to central collection point:	48 171	
Settlement	No. of HH	No. of containers
Siyanqoba	5000	10
Duvha Park Ext 1	505	2
Empumelelweni RDP	2850	2
Empumelelweni informal settlement	8905	3
Old Cornation	2 500	2
Mbeki	200	2
Tsietsi	180	2
Thala	630	2
Sizanani	495	2
Mpondozankomo	500	2
Masakhane	3300	1

Table 15: Total number of households and mass container removal service in un-serviced areas.

M&S	1573	1
Duvha Park informal	2933	1
Springvalley	4078	0
Marikana	8010	0
Iraq	1638	0
Hlalanikahle informal	1078	0
Vosman	1163	1
Ext.12 (P. Ndimande)	3068	1
TOTAL	48604	34

6.2 KERB-SIDE REFUSE COLLECTION SYSTEM

ELM has waste management fleet of around 49 vehicles. All maintenance and repairs are performed internally at the main workshop located in eMalahleni City. ELM provides formal households with a once per week, kerb-side, waste collection service using ELM owned and operated waste collection vehicles. Householders purchase black bin bags for general waste and then place the bags on the kerbside on the specified collection day.

A typical ELM Kerbside collection team includes a driver and 5 assistants. The number of teams utilised varies and is dependent on the quantities of waste generated per area. Table below provides a brief overview of ELM's current waste management fleet status.

Table 16: ELM Waste Management Fleet

VEHICLE TYPE	CORE FUNCTION	COMMENTS
Light Delivery Vehicle (LDV)	Utilised by ELM personnel for site visits, inspections and daily operations such as street cleansing	Not sufficient for supervision and site visits
Tractor	Used to hitch the universal container carriers at Ga-Nala	
Rear End Loaders	Used for collection and compaction of waste sourced from residential areas.	Not sufficient and consistent breakdowns.
Rear End Loaders (with bin lifters)	Used for collection and compaction of waste sourced from residential areas. Waste is transported to landfill, bin lifters incorporated in body design. 1 allocated in Emalahleni and 2 in Ga-Nala.	Utilized for 240-liter bin collection in formal residential households and businesses. Not sufficient and consistent breakdowns which result refuse collection backlogs

Skip Loader Trucks (Load Luggers)	Mainly utilised for business contracts, used for collection of 5m ³ and 11m ³ skips	Only 4 are operational and 2 to be scrapped. 2 trucks operate in Emalahleni, 1 in Ga-Nala and 1 in Ogies. Not sufficient and consistent breakdowns
Street Cleaning Truck	Street cleaning in the CBD also used on freeways	Not sufficient and consistent breakdowns
Tipper Trucks	Used for clearing illegal dumping sites	Not sufficient and consistent breakdowns
Front End Loader	Operated mainly at illegal dumping sites to load litter into tipper trucks	Consistent breakdowns

(a) Commercial Areas

Commercial areas, including the ELM CBD, other urban and suburban commercial areas, shops and offices receive waste collection services under specific contract with ELM, or use private waste collection companies. Skip bins are placed within these commercial areas and when the skips are full, they are removed by specialised municipal load-lugger trucks and transported to the nearest ELM landfill for disposal. The frequency of collection is a minimum of once per week, but can be more frequent by arrangement. Large shopping centres utilise private waste contractors to handle their waste.

The extension of ELM waste collection services to additional businesses presents an opportunity to enhance the ELM Waste Management income for waste management.

(b) Industrial Areas

Industries are serviced under contract by either ELM or private waste collection companies. ELM only collects general waste, while some specialist waste collection companies are contracted to collect hazardous waste for disposal in appropriately licenced privately owned and operated hazardous landfills.

Hazardous medical waste (health care risk waste) that is generated at various healthcare facilities is collected by specialized hazardous waste removal companies such as Compass Waste. General waste from health facilities are collected by ELM once a week in bulk closed containers.

(c) Street Sweeping

ELM currently employs around 32 street sweepers who are mainly deployed within the CBD area as, well as main entrance and exit points to the CBD. ELM will deploy the street sweeping team to other

areas if required, but the main focus is on the CBD. Street sweeping teams are only deployed to the other smaller CBD areas as and when required.

Litter is collected and packaged in black plastic bags which are collected by a dedicated street sweeping collection truck. Street sweepers often work double shifts. Due to safety concerns and inadequate street lighting night work is concluded by 19h00. Discussions with ELM have indicated that street sweeping services need to be improved as certain areas are being neglected due to limited resources.

(d) Waste collection frequency and schedule

The ELM waste collection frequency and schedule are summarised as follows:

Table 17: Frequency of waste collection

Waste Type	Frequency	Service provided by
Domestic	X 1 per week	Municipality
Commercial	As per contractual agreement	Municipality
		Private Contractors

Table 18: Current refuse removal schedule for ELM

EMALAHLENI WEST				
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Lynville Ext. 1	Kwa-Guqa Ext. 4	Kwa-Guqa Ext.1 A	Hlalanikahle Ext. 1 A	Klarinet Ext. 3, 4, 5, 6, 7, 8, & 9
Lynville Ext. 2	Kwa-Guqa Ext. 5	Kwa-Guqa Ext. 1 A	Hlalanikahle Ext. 1 B	Kwa-Mthunzivilakazi (Clewer)
KwaThomas Mahlanguville Ext. 1 & RDP portion	Kwa-Guqa Ext. 7 & 9 Vosman 16	Kwa-Guqa Ext. 10	Hlalanikahle Ext. 2	Schoongezicht
KwaThomas Mahlanguville Ext. 2	Vosman 17	Kwa-Guqa Ext. 10 (RDP portion)	Hlalanikahle Ext. 3	Pine Ridge
KwaThomas Mahlanguville Ext. 3	CBD	Kwa-Guqa Ext. 11	Hlalanikahle Ext. 4	Ferrobank
Thushanang	Emsagweni	Kwa-Guqa Ext. 11 & 18	Hlalanikahle Waiting Area	CBD
Thushanang Flats		CBD	CBD	Klarinet Industries
CBD		Emalahleni Ext. 3		
		Paxton Prison		
EMALAHLENI EAST				

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Duvha Park Ext. 1	Ext. 16 (Midas side)	Ext. 41, 25, 18, 65, 56, 51, 54	Jackaroo Park	Die Heuwel
Duvha Park Ext. 2-9	Ext. 16 (Dam side)	Ext. 1, 5, 38, 9, 12, 3,	Clear Water Estate	Ext. 24
Duvha Park Ext.7 & 8	Del Judor Ext. 1, 2, 5, 30, 10, 21, 17, 18, 20, 30, 31	Ext. 10	Riverview Plots	Reyno Ridge Ext. 1, 2, 3, 5, 6, 10, 11, 15, 16, 17, 18
Tasbet Park Ext. 1	Del Judor Ext. 4, 12	Del Judor Proper	Ext. 35	Ben Fleur Ext. 3, 4, 7, 9 & 11
Tasbet Park Ext. 2	Bankenveld	Die Heuwel x 8	Die Heuwel Ext.1, 2, 4, 6	Reyno Ridge
Tasbet Park Ext. 3	N4 Business Park	Del Judor x 25	Blancheville Ext. 1, 2, 4, 5 & 6	Reyno Heights
Tasbet Park Ext. 12	Duvha Park Ext. 9, 11 & 17	Tshwane University	Zeekoewater Plots	
Khayalami, South View, Green Village, Ridgeway, Mopanie and Woodlands	Corridor Hill	Emalaheni x 8	Highveld Park Ext. 1, 2, 3, 4, 5 & 8	
Tasbet Park Ext. 22, 24 & 26			Die Heuwel Ext. 9, 10, 11	
			Model Park Ext. 5, 6, 9, 10, 11, 13, 57	
			Model Park	
			Ext. 23, 29, 27, 28, 36, 33, 60	
			Fransville	
OGIES/PHOLA				
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Phola - Zone 1, Four Rooms, Ebasuthwini	Phola - Oyco, Vezi, Ezipokweni	Phola - Buffer Zone/Tycoon	Phola - Bhoqli	Phola - Zone 5, New stand
Wilge - Wilge	Ogies - Domestic refuse Dark City			Ogies - Only business refuse
Ogies - Mass containers	Makause			
Extended Oyco				
GA-NALA				
MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
Zone 1	Zone 2	Zone 3	Thubelihle	Silwerfleur (Old Age Village)
				Ext. 4 & 5 - Thubelihle

(e) Waste Collection Receptacles

A variety of waste receptacles are used according to the waste produced and waste collection methods are utilised throughout the municipality. Examples of these receptacles are presented in the table below.

Table 191: Waste Collection Receptacle per Waste Type Adopted by ELM

WASTE PRODUCED	WASTE STORAGE TYPE		WASTE COLLECTION PROCEDURE
DOMESTIC	Bin bags –household refuse disposal		Kerb-side
	240 litre wheeled refuse containers – Hygienic storage and collection of domestic refuse in high density residential areas. <i>(ELM are in the process of implementing the use of wheeled refuse containers)</i>		Kerb-side
GARDEN REFUSE	Bin bags – garden refuse disposal		Kerb-side
	Bulk garden and domestic waste can be disposed of at one of ELM's landfill sites by householder or contractor.		Disposal at Refuse Site
COMMERCIAL	5.5 m³ skip – Removal of dense, high volume non-compactable dry waste.		Pre-determined area
STREET CLEANING	Bin bags –street cleaning disposal		Kerb-side

(f) Number of Households that do not receive waste collection services and illegal dumping

The table below depicts the number of households in informal settlements and newly established households which do not receive waste collection services. Table 15 above depicts the number of households that do not receive regular refuse collection service.

An estimated 350 illegal dump sites scattered across the municipality. Illegal dumping is a serious issue as significant additional revenue is spent by ELM to remove litter along roadsides and from vacant properties. Illegal dumpsites have numerous negative impacts namely associated with the environment and human health.

The causes of illegal dumping are attributed to the following issues:

- Poor waste removal services within specific areas,
- Lack of convenient waste drop-off/transfer stations,
- Lack of education and public awareness,
- Many informal settlements with poor road infrastructure,
- Backyard dwellers and boarding houses
- Ignorance of the community members(mind set).

The current manner in which illegal dumping is addressed within ELM is as follows:

- When complaints are received, the location and the complaints details are entered into a register.
- The location is mapped, photographed and entered into the monthly illegal dumping removal schedule.
- The site is photographed again after the removal of the illegal dumping
- At present, 4 x 6m³ Tipper Trucks and 1 x Front End Loader (FEL) are used to remove illegal dumps. However, this appears insufficient to cope with the current extent of illegal dumping
- Areas repeatedly used for illegal dumping are addressed by involving the community in illegal dumping awareness, and the Community Work Program participants. An Adopt a Spot campaign is also held to try and keep these areas clean. This may also include converting these areas to food gardens, parks, or other measures that will seek to address the challenge.

7. FINANCING OF WASTE MANAGEMENT

Operational income for waste management within the ELM is mostly sourced from tariffs. The different tariff types are reflected in the table below **Table** which was based on the tariffs structure for 2018/2019 Operational Budget: Section Waste Management.

Table 20: Refuse Removal Tariffs for Various residential and commercial/Industrial properties.

DESCRIPTION	2018/2019
RESIDENTIAL PROPERTIES - Fixed monthly charge	R 132.44
LOW COST HOUSING (RDP) - Fixed monthly charge	R 132.44
PRIVATELY DEVELOPED RESIDENTIAL TOWNSHIP PROPERTIES BULK SUPPLY (Inc. Flats) - Refuse service charge per number of dwellings/flats	R 132.44

INDIGENT RESIDENTIAL PROPERTIES - Provided that such owner is a registered indigent as provided for in the Indigent Policy of the municipality	R 66.22
RETIRED PERSONS OVER THE AGE OF SIXTY (60) AND DISABLED PERSONS who are registered owners of residential properties	R 66.22
INDUSTRIAL PROPERTIES	R 801.31
BUSINESS AND COMMERCIAL	
a) Removal once per week	R 225.45
b) Removal 5 times per week	R 490.44
c) Removal of medical waste	R 242.89
PLACES OF PUBLIC WORSHIP	R 73.51
AGRICULTURAL LAND	R 147.02
BED AND BREAKFAST - Where the owner of the property personally use it as a residence, use two or more rooms for private use only and does not own more than one property in the jurisdiction of the municipality	R 297.62
BULK REFUSE REMOVAL PERMANENT PER REMOVAL	
a) Mass containers (6m ³)	R 801.36
b) Mass containers (5.5m ³)	R 736.51
c) Mass containers (3m ³)	R 430.04
d) Mass containers 3 × per week (1.75m ³)	R 3 319.87
d) Mass containers 5 × per week (1.75m ³)	R 5 548.82
BULK REFUSE PERMANENT PER MONTH (HIRE TARIFF)	
a) Mass containers (6m ³)	R 457.94
b) Mass containers (5.5m ³)	R 269.37
c) Mass containers (3 & 4m ³)	R 269.37
DUMPING OF REFUSE - LANDFILL SITE:	
a) Vehicles with capacity - from 0 - 1 000kg	R 0.00
b) Vehicles with capacity - from 1 001 - 5 000kg	R 101.89
c) Vehicles with capacity above 5 000kg	R 190.99
d) Persons outside municipal area	R 318.31
e) Soil and other material, suitable for covering disposal site	R 0.00
REFUSE COMPACTED	
a) Removal tariff (0.084m ³)	R 136.03
b) Removal tariff per m ³	R 207.59
SPECIAL REMOVAL: BUILDING OR BULK REFUSE: Removal per 6m³	
GARDEN REFUSE: Removal per 6m³	R 282.06
COLLECTION & DESTRUCTION OF FOODSTUFF: Removal per 6m³	R 781.44

REDUNTANT VEHICLES: Per vehicle	R 1 046.11
REMOVAL OF UNLAWFULLY DUMPED REFUSE: Removal per 3m ³	R 870.80
REMOVAL AND DISPOSAL OF DEAD ANIMALS:	
a) Horses, cattle, donkeys (per carcass)	R 786.09
b) Calves, goats, sheep (per carcass)	R306.79
c) Dogs & cats (per carcass)	R 89.42
ILLLEGAL DUMPING OF REFUSE per offence	R 5 972.05
APPLICATION AND PROCESSING FEES FOR WASTE DISPOSAL PERMITS	R 158.55
WASTE TRANSPORTATION PERMITS FEES	
BUSINESS WASTE INLCUDING BULK CONTAINARISED WASTE: HEAD OFFICE WITHIN EMALAHLENI	R 3 171.00
BUSINESS WASTE INLCUDING BULK CONTAINARISED WASTE: HEAD OFFICE OUTSIDE EMALAHLENI	R 5 285.00
BULK INDUSTRIALISED NON-TOXIC WASTE: HEAD OFFICE WITHIN EMALAHLENI	R 3 171.00
BULK INDUSTRIALISED NON-TOXIC WASTE: HEAD OFFICE OUTSIDE EMALAHLENI	R 5 285.00
RECYCLABLE WASTE: HEAD OFFICE WITHIN EMALAHLENI	R 2 114.00
RECYCLABLE WASTE: HEAD OFFICE OUTSIDE EMALAHLENI	R 5 285.00
BUILDING WASTE: HEAD OFFICE WITHIN EMALAHLENI	R 1 057.00
BUILDING WASTE: HEAD OFFICE OUTSIDE EMALAHLENI	R 3 171.00

The disposal of waste at municipal landfills by private contractors, issuing of transportation and disposal permits are other sources of operational income for the municipality.

As illustrated in the above **Table 20 above**, the waste collection tariff for residential properties, low cost housing and privately developed residential townships are identical. A comparison with other municipal waste collection tariffs indicates that in most cases the stipulated tariff is based on property value or property size. For example, eThekweni Municipality monthly residential refuse removal rate is based on the property value. As per their 2018/2019 tariff guideline, property values of less than R250, 000.00 are exempted from paying additional amount above the fixed rate while property values greater than R250, 000.00 will have to pay between R35.76 ex vat to R174.85 ex vat, depending on the property value.

One the other hand, ELM's neighbouring municipality, Steve Tshwete Local Municipality, adopts another approach in a manner that waste collection tariffs are based for residential properties. For the

2018/2019 financial year residential erven up to 995m³ are charged R131.60 ex vat while residential erven exceeding 995m³ are charged R188.35 ex vat. Flats, town houses and other residential complexes are charged R169.15 ex vat. Formalised informal housing settlements and rural villages are charged R66.10 ex vat monthly.

ELM will need to relook at their tariffs to be more accurate instead of billing different residential types the same. Integration of rates information could aid setting tariffs as per eThekweni's model, or using GIS and calculating waste removal tariffs per erven size for residential properties.

The table below illustrates that ELM received around R129, 000,000.00 of income from waste management whereby the majority of its operational income was sourced from domestic refuse removal which equates to 81% of the income generated. User charges and tariffs associated with disposal of waste at ELM facilities account for around 6% of revenue generated.

7.1 Operational income

Table 21: Operational Income from Waste Management for the 2017/18 period

ITEM	BUDGET YEAR 17/18	PERCENTAGE
DEPARTMENTAL LEVIES - REFUSE	R 823,301.00	0.6%
REFUSE - BUSINESS: KRIEL	R 359,328.00	0.3%
REFUSE - BUSINESS: OGIES	R 96,972.00	0.1%
REFUSE - DOMESTIC - KRIEL	R 9,505,679.00	7.4%
REFUSE - DOMESTIC - OGIES	R 6,465,664.00	5.0%
REFUSE - DUMPING FEES	R 338,307.00	0.3%
REFUSE - GARDEN REFUSE	R 96,374.00	0.1%
REFUSE - RIETSPRUIT	R 13,462.00	0.0%
REFUSE - THUBELIHLE KRIEL	R 578,551.00	0.4%
REFUSE FEES - BUSINESS 3X	R 7,361,657.00	5.7%
REFUSE FEES - BUSINESS 5X	R 606,079.00	0.5%
REFUSE FEES - DOMESTIC	R 87,803,787.00	68.2%
REFUSE FEES - MASS REMOVAL	R 11,174,902.00	8.7%
WASTE MANAGEMENT (ANGLO AMERICAN) KLEINKOPIES	R 1,500,000.00	1.2%
WASTE MANAGEMENT (ANGLO AMERICAN) LANDAU	R 2,000,000.00	1.6%
TOTAL INCOME (EX VAT)	R 128,724,063.00	100.0%

7.2 Operational Costs in Waste Management

As with all municipal services, waste management has numerous associated costs. Aspects such as operating plant and equipment, managing landfills as well as staff salaries account for majority of the daily operational costs to render an efficient waste removal service. These costs are presented in the table below.

Table 22: Operational Expenses from Waste Management for the 2017/18 period

ITEM	BUDGET YEAR 17/18	PERCENTAGE
ALLOWANCES - NIGHT SHIFT WORKERS	R 325,453.69	0.3%
ALLOWANCES - STANDBY	R 242,513.64	0.2%
ALLOWANCES - TELEPHONE	R 57,974.40	0.0%
ALLOWANCES - TRANSPORT	R 700,002.75	0.6%
ANALYSIS - COSTS	R 27,508.00	0.0%
BUILDINGS	R 194,090.00	0.2%
CLEANSING DEPOT	R 22,468.00	0.0%
CLEANSING OF CITY	R 800,000.00	0.6%
CONTR - PROVISION FOR BAD DEBTS	R 24,880,152.00	20.0%
CONTRIBUTION - GROUP INSURANCE	R 648,515.29	0.5%
CONTRIBUTION - MEDICAL SCHEMES	R 5,611,185.65	4.5%
CONTRIBUTION - PENSION FUND	R 7,133,668.24	5.7%
DEPRECIATION - COMPUTER EQUIPMENT	R 267,372.25	0.2%
DEPRECIATION - FURNITURE AND OFFICE EQUIPMENT	R 253,000.00	0.2%
DEPRECIATION - MACHINERY AND EQUIPMENT	R 511,486.15	0.4%
DEPRECIATION - SOLID WASTE INFRASTRUCTURE	R 3,360,016.94	2.7%
DEPRECIATION - TRANSPORT ASSETS	R 54,530.07	0.0%
DUMPING SITES	R 320,189.00	0.3%
DUST BINS/REFUSE BAGS-PURCHASES	R 35,680.00	0.0%
ELECTRICITY - DEPARTMENTAL	R 102,842.00	0.1%
FUEL & OIL	R 4,903,068.00	3.9%
INSURANCE	R 936,036.46	0.8%
INTEREST: EXTERNAL LOANS	R 500,642.98	0.4%
INTEREST: LANDFILL SITE	R 450,000.00	0.4%
LDV.S X 1	R 300,000.00	0.2%
LEAVE BONUSES	R 2,695,140.34	2.2%
LEEUPOORT CONSTRUCTION OF LANDFILL SITE	R 5,100,000.00	4.1%
LICENSES - MOTOR VEHICLES	R 1,036,507.00	0.8%
LICENSES - RADIO'S & SUNDRIES	R 4,081.00	0.0%

ITEM	BUDGET YEAR 17/18	PERCENTAGE
LOAD LUGGER	R 1,500,000.00	1.2%
MANAGEMENT: LAND FILL SITE	R 6,080,304.00	4.9%
MATERIALS AND PROVISIONS	R 70,047.00	0.1%
MEMBERSHIP / SUBSCRIPTION FEES	R 3,120.00	0.0%
MOTOR VEHICLES	R 6,049,887.00	4.9%
OVERTIME	R 4,359,251.86	3.5%
PRINTING AND STATIONERY	R 32,584.00	0.0%
PROFESSIONAL SERVICES	R 1,200,000.00	1.0%
RADIO COMMUNICATION	R 10,000.00	0.0%
REFUSE COMPACTER	R 2,600,000.00	2.1%
REFUSE DUMP REMOVALS - RIETSPRUIT SK	R 381,063.00	0.3%
REMUNERATION	R 33,350,660.16	26.8%
RENTAL - MACHINERY AND EQUIPMENT	R 100,523.00	0.1%
SEWERAGE - DEPARTMENTAL	R 7,853.00	0.0%
SUBSIDIES - HOUSING	R 291,032.39	0.2%
SUBSIDIES - INSURANCE	R 984.26	0.0%
SUBSIDIES - MOTOR VEHICLE LOANS	R 4,058.23	0.0%
SWEEPING OF STREETS	R 20,000.00	0.0%
SWEEPING OF STREETS: CONTRACTORS PAY	R 100,840.00	0.1%
TELEPHONE SERVICES	R 16,431.00	0.0%
TOOLS & EQUIPMENT	R 90,643.00	0.1%
TRAVEL/SUBS. EXP. & DEL. COSTS	R 92,378.00	0.1%
TYRES	R 1,597,046.00	1.3%
UNEMPLOYMENT INSURANCE FUND (U.I.F)	R 391,499.90	0.3%
UNIFORMS 7 PROTECTIVE CLOTHING	R 713,645.00	0.6%
VEHICLE TRACKING	R 48,351.00	0.0%
WASTE MANAGEMENT (ANGLO AMERICAN) KLEINKOPIES	R 1,500,000.00	1.2%
WASTE MANAGEMENT (ANGLO AMERICAN) LANDAU	R 2,000,000.00	1.6%
WORKMEN'S COMPENSATION	R 203,365.00	0.2%
TOTAL INCOME (EX VAT)	R 124,289,690.65	100.0%

The table above clearly illustrates that majority of the operational expenses relating to waste management is due to salaries/wages as well as all associated employee benefits. 20% of operational expenditure is due to bad debt, this will need to be addressed going forward as expenditure costs increase annually.

A summary of the ELM Waste Management Income and Expenditure is presented in in the table below.

Table 23: Summary of Income and Expenditure from Waste Management for the 2017/18

Summary	BUDGET YEAR 17/18
Total Income	R 128,724,063.00
Total Expenses	R 124,289,690.65
Surplus	R 4,434,372.35

Operational income is found to be higher than operational expenses, resulting in an apparent operating surplus for waste management. However, as is evident in this Status Quo, ELM faces significant challenges due to inadequate waste collection and waste disposal operations. To properly implement an adequate and legally compliant waste management service will result in significantly increased costs and expenses. Thus, it is expected that current funding will not be sufficient to implement compliant waste management services, and needs to be addressed urgently.

Aspects such as increasing labour costs, increasing labour requirements, possible increase contractor utilisation and fluctuations in fuel pricing etc. will also result in the waste management expenses increasing over a period of time. An increase in population size and future planning to incorporate un-serviced areas will also require additional budget for waste management into the future.

7.3 Safeguard of waste infrastructure

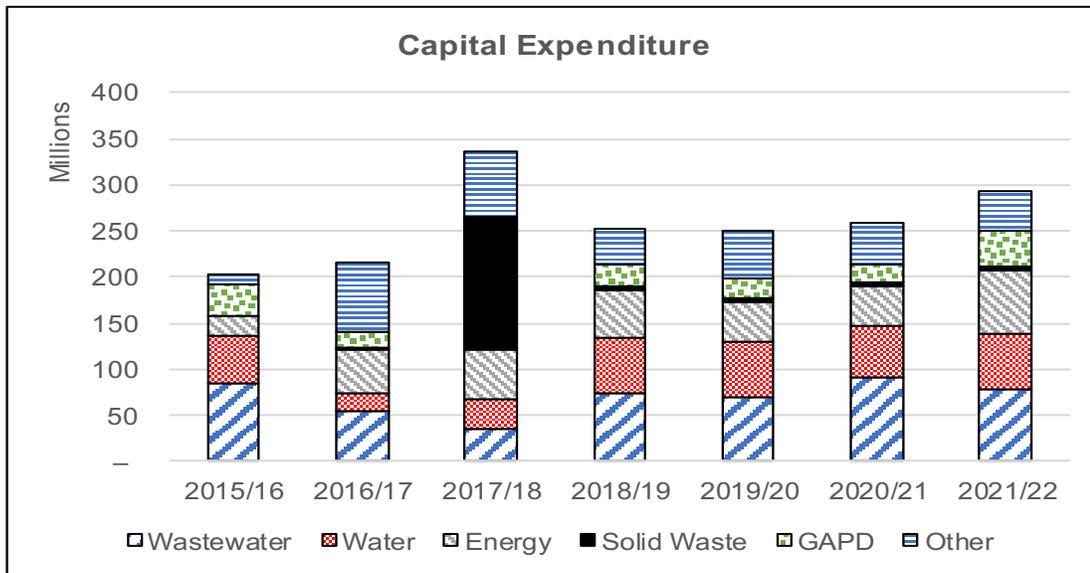
This is a very serious challenge facing the municipality. Municipal infrastructure continues to be a target of vandalism and human destruction. Ga-Nala and Phola landfills continue to be targets of vandalism and destruction causing the municipality huge amounts for repairs and maintenance. The municipality needs to prioritise a 24/7 security which can be augmented with security alarm system.

The theft of waste mass containers is also a cause for concern. Mass containers which are placed at various strategic areas to accommodate domestic waste, especially in un-serviced areas have also become a target of theft and vandalism. The municipality needs to develop security alert system that will safeguard these mass containers.

7.4 Capital Expenditure

The historic and projected municipal capital budget for Emalahleni as per the MediumTerm Revenue and Expenditure Framework (MTREF) is presented in the diagram below.

Figure 16: Capital expenditure in terms of the different service delivery outputs within the municipality



The diagram above highlights that the municipality has several competing priorities that require funding. Capital expenditure increase from just above R200 million in 2015/16 and peaked in 2017/18 at R335 million before falling to around the **R250 million mark in 2018/19 and 2019/20**. However, the current MTREF budget projects an upward trend going forward, increasing to R258 million in 2020/21 and R292 in 2021/22. The projected budget increase between 2020/21 and 2021/22 equates to a 13.2% increase, following three years of a massive decline and stagnation. On average, the Water Services component has attracted the bulk of the capital expenditure over the 2015/16 and 2021/22 planning period.

Notably, Solid Waste has traditionally received the lowest allocation in the municipality, with the exception of 2017/18 when this expenditure item received the single largest share of the total budget allocation, almost nearly half of the total budget allocation for that year. The increase in Solid Waste expenditure was the main cause of the abnormal increase in the overall budget allocation in 2017/18, which resulted in an overall increase of around 60% in the total allocation from 206/17. The allocation to Solid Waste capital projects is R3.8 million and R4.16 million for 2020/21 and 2021/22, respectively. The municipality has allocated R2 millions of this budget towards landfill sites for each of these two financial years. In addition to this, the municipality has allocated R5 million over the next two years for the acquisition of 2 refuse compactors in 2020/21 and 2021/22. This has been allocated to Fleet on the municipal budget.

7.5 Estimated Annual Income

The estimated annual income was based on the total number of households and other waste collection service points charged at the ELM published 2018/2019 tariffs, plus commercial collection income and landfill fees. A small allowance of R10m (when compared to the current budgeted amount of R24, 88m) was made for bad debt.

No allowance was made for potential income from selling recovered recycled materials due to the volatility of the recycled materials market, and the transport distance to the major materials processors. The economics and economy of scale of recycling is complex, especially as currently the policy applied by central government is to adopt a free market approach to the value of recycled materials. The plastics industry applies a levy to virgin material to assist subsidise the recycling of plastics.

Although an income from the selling of recycled materials is expected, the conservative approach is to regard the real value of recycling to reduce the amount of waste being landfilled. This value is realised only when the full cost of transport of waste to landfill, and the full cost of landfilling in accordance with the Permits/WML is understood. This thinking underlies the concept applied even at larger centres such as Cape Town, where the recycling process is cross subsidised by various mechanisms.

The estimated potential annual income for 2018/2019 is presented in the table below. This income is then also escalated at 5, 8% inflation and 2% growth in population for the next 10 years, as per the cost model, and is presented in the table below.

Table 24: Estimated income for waste management 2018/2019

UNIT	Monthly Tariff 2018/2019	No of Units	Estimated Annual Income 2018/2019	NOTES
Households (1x per week)	R132.44	105,000	R166,874,400	Extended households/ backyard dwellings should be billed extra for refuse collection

Bed & Breakfast	R297.62	75	R267,858	All Guest houses should be identified by the Business unit and charged accordingly.
CBD (1x per week)	R225.45	100	R270,540	These should be improved through Business Development Officer
CBD (5x per week)	R490.44	150	R882,792	
Commercial Collections 3x per week			R7,781,000	Based on 2018/2019 Budget
Commercial Collections 5x per week			R641,000	Based on 2018/2019 Budget
Commercial Mass Removals			R11,800,000	Based on 2018/2019 Budget
Landfill Fees			R2,500,000	Improved billing from weighbridges
PROVISION FOR BAD DEBT			(R10,000,000)	TO BE DETERMINED
	Total Estimated Income 2018/19		R181,017,590	

It must be noted that the 2018/2019 budgeted income from domestic (household) collection through rates was R87,8m, just over half of the amount shown in the table above. ELM Waste Management Department estimate that there are approximately 105 000 households that should receive a waste collection service, and should therefore pay rates. It is not known the extent of the current ELM rates base, and this presents a significant risk to the affordability of improved and extended waste management service delivery.

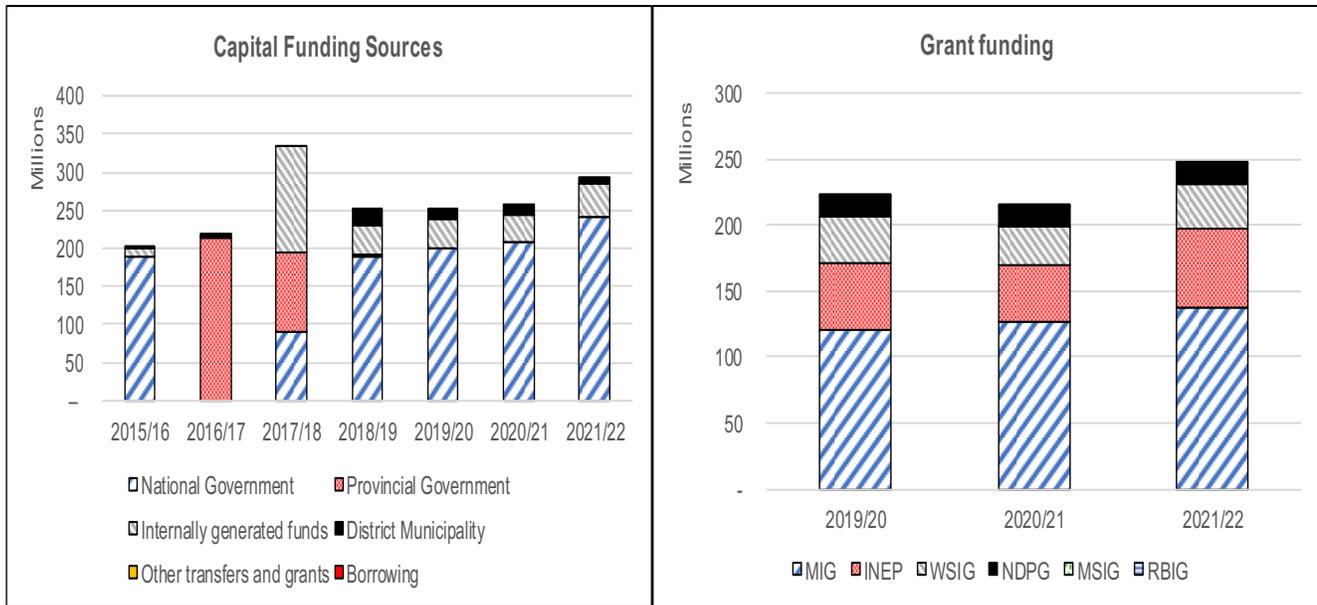
The potential annual income over the next ten years is compared to the estimated costs of both models in the above table.

7.6 Capital funding sources

The two figures below provide an indication of the municipal capital funding sources.

Figure 17: Capital Funding Sources

Figure 18: Grant funding



The diagram above highlights that the municipality receives a large portion of its funding for capital expenditure from national government (except in 2016/17 when all funding was received from Provincial Government). This is in the form of capital grants. The municipality is able to generate a surplus on the operating account which is then transferred to the capital budget as internally generated funds.

It is noted that the municipality did not have any internally generated funds in 2016/17, but this category of funding increased exponentially in 2017/18, the same year that expenditure on Solid Waste was highest in the municipality, before dropping in 2018/19. The current budget reflects that the municipality is projecting internally generated funds for all three years between 2019/20 – 2021/22.

The capital budget does not project any transfers from provincial government over the medium term. Either the municipality does not project any borrowings, or planned borrowings are insignificant. Figure... indicates that grant funding is expected to be R215 million in 2020/21 and R248 million in 2021/22 (an increase of 15.3%). The Municipal Infrastructure Grant (MIG) allocation is expected to average R127 million over the three years. The municipality is also expecting to receive a sizeable allocation of the INEP Grant over the same period.

7.7 Implementation Instruments

There are two broad options that are available for the municipality to enhance capital expenditure towards the Solid Waste project. The first option is to reallocate any unspent monies on its current towards funding Solid Waste projects. The second option is to consider additional sources of funding

to fund Solid Waste expenditure. The following options to raise new sources of capital to the municipality could be explored:

(a) Increase Grant Funding Allocation

Emalahleni LM does receive Grant funding through a variety of grants as discussed under Figure 26 but this does not include the Regional Bulk Infrastructure Grant (RBIG). As a funding strategy, the municipality may could raise funding from the RBIG for appropriate water and wastewater infrastructure projects. This could result in a reallocation of MIG funding towards Solid Waste projects.

(b) Take Up Debt

Taking up Debt is another funding mechanism that could be explored by Emalahleni LM. This funding option has been used in the past with the municipality having a debt obligation of R85 million at the end of the 2018 financial year but the Municipality has not projected to utilize this option over the MTREF. For this option to be considered, certain requirements of funders would need to be met, amongst these funders would look into aspects such as:

- The borrowing capacity of the municipality
- Affordability and cash flow/ liquidity position of the municipality
- The municipality's recent audit opinion (Auditor General's Report)
- Institutional capacity of the municipality

(c) Public Contributions and Donations

Public contributions and donations are a capital funding source that can also be explored by Emalahleni LM. The municipality has been able to access this type of funding in the past and could revisit this strategy in the future. This should be considered on a project by project basis and through engagement with appropriate industrial partners.

(d) Public Private Partnerships

Public-private partnerships (PPPs) are a funding option that is able to leverage private sector funds and skills for project funding, implementation and operation and maintenance (O&M). A PPP would essentially provide an opportunity for the municipality to enter into appropriate contractual relationships with the private sector for the Design, Build, O&M and Financing of projects, thus transferring the key project development risks (e.g. financing, implementation, O&M, etc.) to the best placed to assume such risks, and thus enable the municipality to divert its budgeted funds into other priorities of the municipality.

PPPs need Government approval through the National Treasury procurement process. Also, PPPs are mostly suited to large projects that generate revenue, such as water, electricity and toll roads projects. However, PPPs can still be structured on a non-revenue generating project if the

municipality has other sources of income to repay the private sector investment. A word of caution, financial and legal advice should be sought prior to embarking on a PPP process.

8. ORGANISATIONAL AND INSTITUTIONAL MATTER

This section provides an overview of Emalahleni's current (2019 -) Waste Management organisational structure and human resources, existing and required.

Table 24: Number of Municipal Waste Management Personnel in ELM

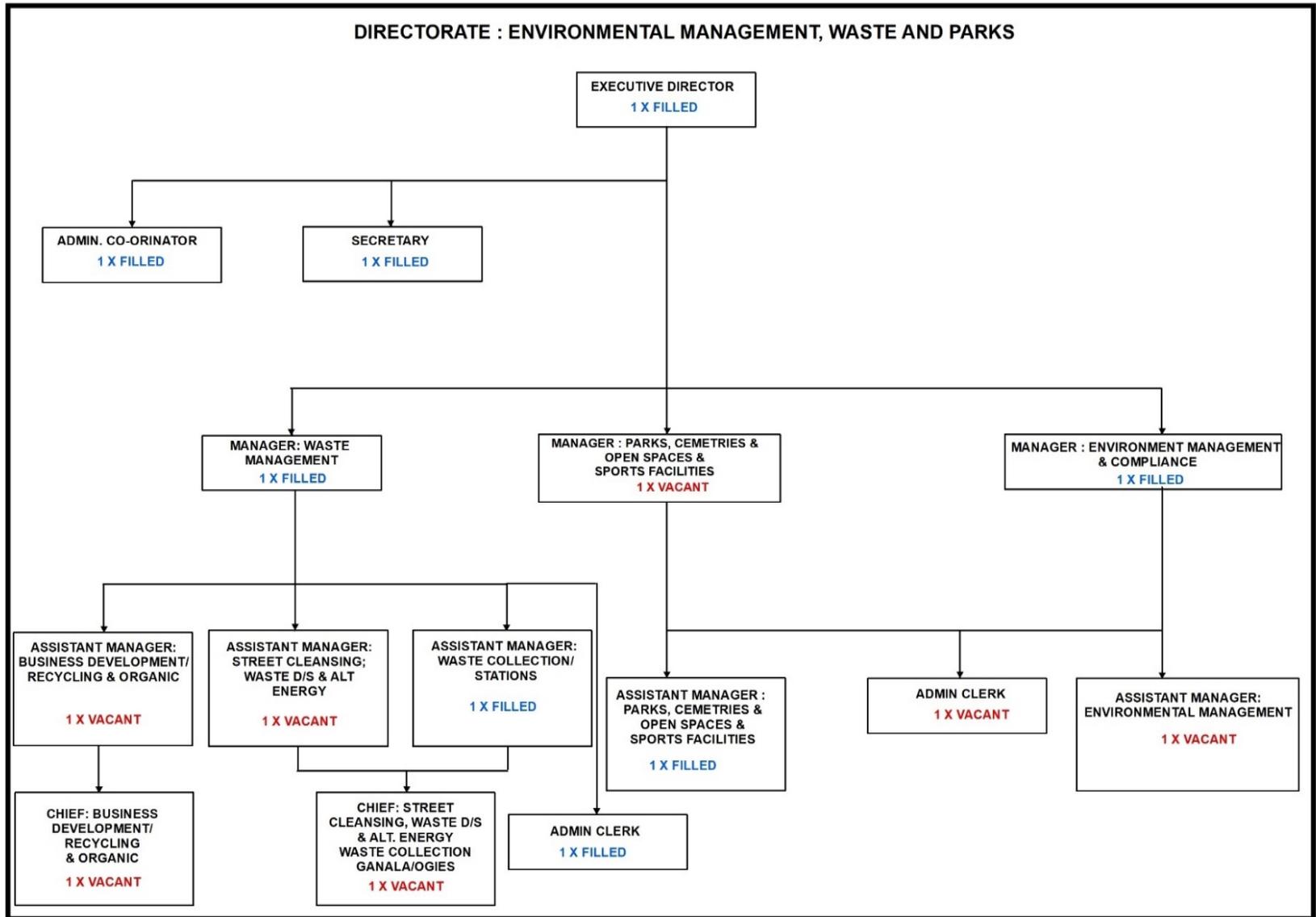
Municipal Waste Management Personnel	
No. of Permanent Employees	189
No. of Contractual Employees (EPWP)	
No. of Vacancies	220

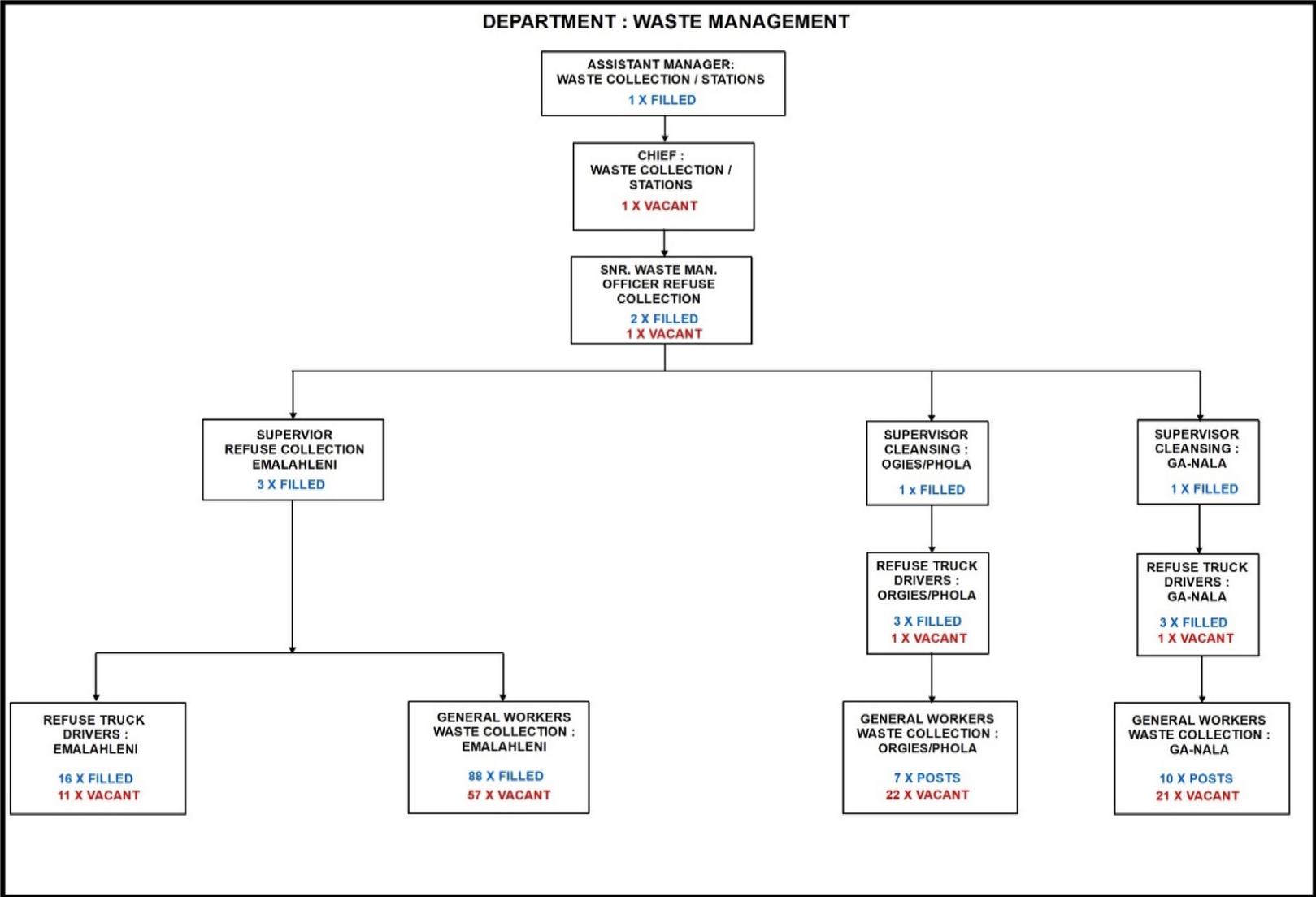
Table 25: Number of Municipal Waste Management Vacancies in ELM

Municipal Waste Management Vacancies	
Executive Director	0
Manager	0
Assistant Managers	0
Clean City Coordinators/ Supervisors	0
Team Leaders – Street Sweeping	0
Team Leaders – Refuse collection teams	4
General Workers – Refuse collection	
General workers – Clean City program	
General Workers – Landfill sites	9
Street Sweepers	21
Truck Drivers	21
Weighbridge Operators	0
Admin Clerk	0
Landfill Supervisor	1
Landfill Machine Operators	Anex 1
Project Co-ordinator	

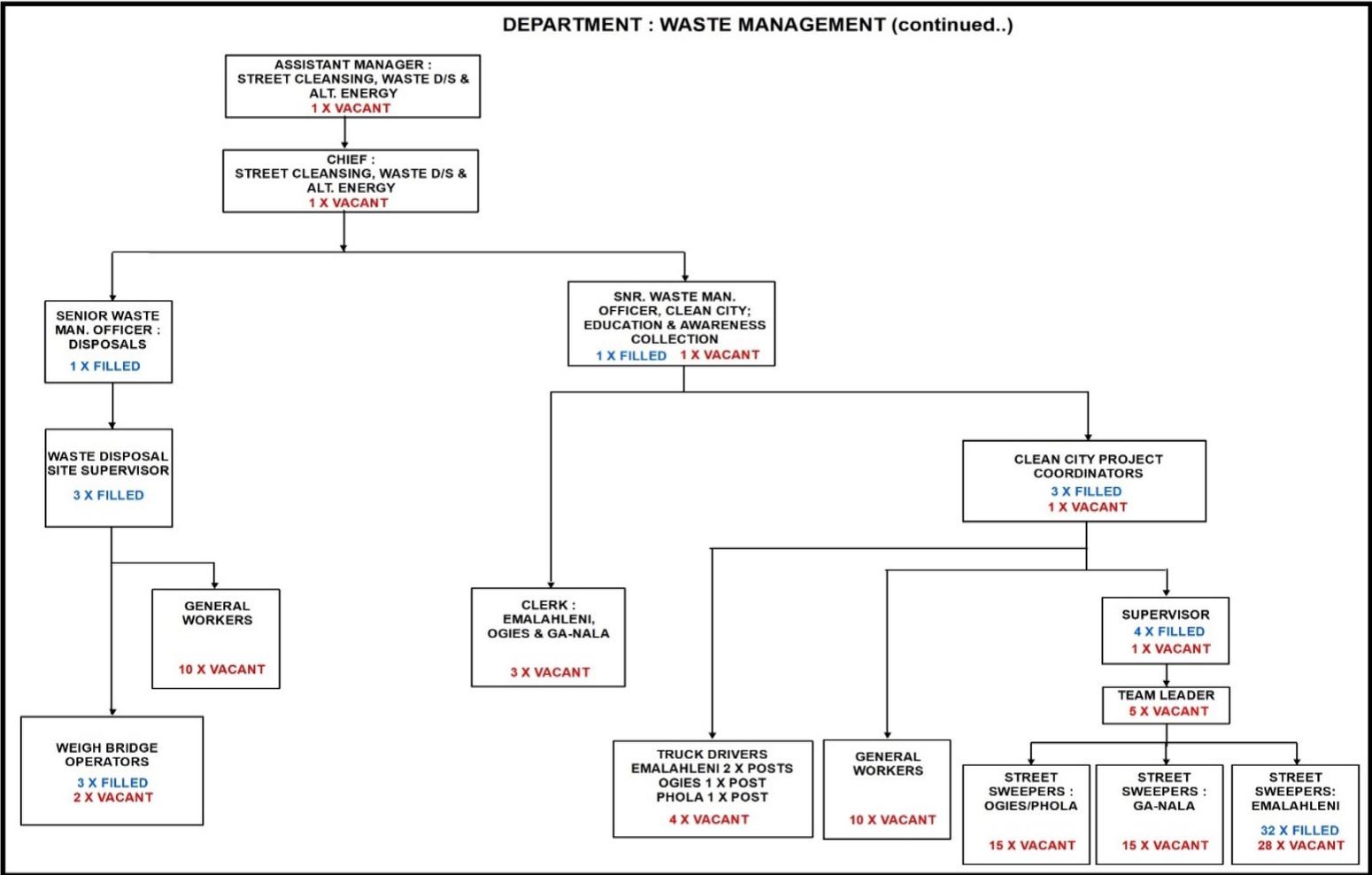
As illustrated in the table above, there are key strategic vacancies in the existing structure that need to be filled in order to promote a more efficient waste management service. The organisational structure of the directorate is presented in the figure below.

Figure 19: Organizational structure of the Directorate Environmental, Parks and Waste Management





DEPARTMENT : WASTE MANAGEMENT (continued..)



9. DESIRED END STATE

This section provides the desired state which the municipality wishes to achieve in the forthcoming years. Goals, targets and indicators have to be developed to ensure that an environmentally and socially acceptable service based on an acceptable standard is rendered at a reasonable price to the communities within ELM.

Goals and indicators were identified in the status quo review of waste management in general.

The following goals pertaining to waste management were identified:

Goal 1: (a) Create a sustainable recycling and reuse culture within the municipality including developing infrastructure for recycling

Goal 2: (a) Create a sustainable culture in the handling, transportation and disposal of waste
(b) Provide minimum level of service to un-serviced areas

Goal 3: (a) Promote good governance through the development and implementation of the Environmental legal tools

Goal 4: (a) Improve revenue collection from all waste management revenue streams

Goal 5: (a) Effective management and operation of the landfill site
(b) Effective management of illegal dumping in informal areas
(c) Effective management of waste in public gathering and public open spaces
(d) Effective management and control of street cleansing

Goal 6: (a) Ensure compliance of municipal landfills

Goal 7: (a) Systematically monitor and enforce compliance with regulations, authorisation conditions and bylaws

9.1 Setting strategic goals, targets and indicators

Goal 1: Promote recycling and recovery of waste			
Objectives	Targets	Activities	Timeframe
Create a sustainable recycling and reuse culture within the municipality including developing infrastructure for recycling	To achieve 15% of recyclables by 2025 and 30% of recyclables by 2030	-Establishment of material recovery facilities and drop off centres	2025
		-Establishment of enviro Groups	2021-22
		Develop and implement a strategy that will introduce the separation at source	2022-27
		Implement the Waste to energy project at the Leeuwpoot landfill site through PPP	2025-27
		- Enhance and coordinate all recycling activities including -Formalization of recycling within Emalahleni	2022-27
		- Establish and implement an organic waste materials policy	2022-27
		-Formulate and implement a waste minimization/recycling policy	2022-2027
		Outsourcing of waste reclamation at the landfill site	2022-2027
		Construction of Buy-back centres (MRFs) in Emalahleni, Ga-Nala and Ogies	2024-2027

		Appointment of 3 x officials to lead and promote recycling and waste minimisation programmes.	2024-2027
		Conduct feasibility study and Construction of 1 x compost plant	2023-2027
Goal 2: Ensure the effective and efficient delivery of waste services			
Objectives	Targets	Activities	Timeframe
Create a sustainable culture in the handling, transportation and disposal of waste	102829 plus 8355 (new households)	- Provide kerbside refuse collection to all formal households	2022-2027
		-Review of the refuse collection schedule	2022/23
		Review and implement a vehicle replacement policy	2023/2024
		-Outsourcing refuse collection in certain areas of Emalahleni Local Municipality or Public partnership agreement	2024/25
		-Procurement of refuse collection vehicles	2022/23
		Enter into a vehicle management and maintenance contract with external service providers	2025-27
		Engage with labour unions and implement a two-shift system for waste collection	2024

	7000 households (Ganala and Rietspruit)	- Provide adequate waste storage facilities for domestic waste by rolling out of 240L wheelie bins to households.	2021-27
Provide minimum level of service to unserviced areas	48100 (predominantly informal settlements)	-Establishment of communal drop off dumping areas	2022/27
		-Provision/procurement of mass containers (6m3)	2022/27
		-Develop and implement communal dump cleaning schedule and mass container clean up schedule	2022/27
Goal 3: Ensure that legislative tools are developed to deliver on the Waste Act and other applicable legislation			
Objectives	Targets	Activities	Timeframe
Promote good governance through the development and implementation of the Environmental legal tools	All by laws and policies reviewed	Review of outdated Solid waste by-laws and policies. Develop anti-littering warning with awareness messages	2022/23
		Develop an appropriate licensing system which is applicable to the collection of commercial waste by private contractors and to keep track of industrial and health care risk waste.	2023

		Review and harness the existing waste information system and to be linked to the National WIS	2023
Goal 4: Sound budgeting and financing of waste management services			
Objectives	Targets	Activities	Timeframe
Improve revenue collection from all waste management revenue streams	All Commercial refuse collection areas	Collect data on the commercial refuse collection services operating within Emalahleni Install alternative waste storage and collection facilities in identified business centres - static compactors for commercial businesses waste.	2023-24 2025-27
	All Landfill site and households	Implement cost reflective and volumetric tariffs	2023-24
	All residential properties	Adjusting refuse collection tariffs to residential properties which accommodate more than 1 household	2023-27
	Revenue enhancement	Adjusting the tariffs for Mass containers hiring	2023-24
	Revenue enhancement and legal compliance	Outsourcing waste reclamation at all Landfill site	2023-27

	Revenue enhancement	Ensure revenue enhancement through issuing of Waste transportation and disposal permits	2022-27
Goal 5: Ensure the safe and proper disposal of waste			
Objectives	Targets	Activities	Timeframe
Effective management and operation of the landfill site	Landfill compliance	<p>Provision of adequate space for the safe disposal of waste through the following:</p> <ul style="list-style-type: none"> A) Construction of Phase two of Leeuwpoot landfill B) Investigation of suitable land for establishment of new regional and centralized landfill site C) Appointment of external service providers for the operation and management of the landfill site/ alternatively, purchase of landfill plant and equipment to operate landfills in-house. D) Acquisition of landfill equipment for inhouse operation E) Appointment and training of staff to operate the landfill equipment/machinery 	2022-27

		F) Installation of weighbridges in Leeuwpoot landfill site	
Effective management of illegal dumping in informal areas	All informal areas	Investigate and develop a strategy for the appropriate communal waste disposal facilities in informal settlements	2024
Effective management of waste in public gathering and public open spaces	All public gathering and public open spaces	Develop and implement a strategy for the control and management of waste in public gathering and public areas.	2024-2027
Effective management and control of street cleansing	All centralised and decentralised business areas	Develop and implement a strategy for adequate and reliable street cleansing service that will cover all central and decentralised business areas. Install street litter bins along main routes, hiking spots and CBD	2023-2027
Ensure compliance of municipal landfills	All landfills	Develop phases 2 and 3 of the Leeuwpoot landfill. Appoint service providers for the operation of landfills/ alternatively, procure equipment for operation of landfills in-house.	2023-2027
Goal 6: Education and awareness			
Objectives	Targets	Activities	Timeframe

Enhance public participation to ensure that the community takes ownership of the environment through cleaning campaigns and greening programmes	All wards	Develop and implement a clean-up programme for all wards.	Continuous
		Establish platform (e.g. hotline) and complaint form on municipal website for reporting of any waste related matter and ensuring efficient client and customer relations	2022-23
		Develop and implement an awareness and education strategy. Create education and awareness among communities on best waste management practices	2022-27 Continuous
		Design/source educational material on waste management	2022-27
		Establish an education and awareness unit within the department.	2024-2027
		Implement the Adopt-a-Spot policy to encourage and support enviro groups	Continuous
		Introduce ward-based cleaning competitions and encourage participants	2023-2027
		Goal 7: Compliance and enforcement	
Objectives	Targets	Activities	Timeframe

Systematically monitor and enforce compliance with regulations, authorisation conditions and bylaws	All landfills	Conduct internal landfill audits/checklist monthly and quarterly in all landfill sites.	Continuous
		Implement a proper and effective waste information system	Continuous
		Implement an effective waste permitting system to all commercial waste transporters	Continuous
		Conduct quarterly water sampling monitoring at all landfill sites	Continuous
	All compliance officers	Establish of the landfill committees in all landfill site	2023-2024
		Appointment of waste management officers as peace officers for the enforcement of the by-laws	2023-2027
		EMI capacity expanded to enforce the Waste Act	2023-2027
All commercial waste transporters and landfill users	Issuing of Waste disposal permit and waste transportation permit in terms of the municipal solid waste by laws	Continuous	

10. IDENTIFY, EVALUATE AND SELECT ALTERNATIVES

This section identifies, evaluate and select alternatives for the abovementioned goals.

10.1. Strategic goals, targets, timeframe, budget

Goal 1: Promote recycling and recovery of waste			
Objectives	Targets	Alternatives	Budget
Create a sustainable recycling and reuse culture within the municipality including developing infrastructure for recycling	To achieve 15% of recyclables by 2025 and 30% of recyclables by 2030	To achieve 10-12% of recyclables	OPEX at least 3% of the total operational budget
	Pilot the separation at source programme at affluent residential complexes	Benchmarking with other municipalities on recycling at source, alternatively, Identify or appoint a service provider to facilitate/ conduct recycling at source.	OPEX at least 3% of the total operational budget
Goal 2: Ensure the effective and efficient delivery of waste services			
Objectives	Targets	Alternatives	Budget
Create a sustainable culture in the handling, transportation and disposal of waste	Deliver effective and efficient waste services to 102829 plus 8355 (new households)	Provision of services through bulk refuse mass container	CAPEX – R23M

		system where resources are limited.	
Provide minimum level of service to un-serviced areas	48100 (predominantly informal settlements)	<p>Provision of services through bulk refuse mass container system where resources are limited.</p> <p>Establishment of communal collection points or mini-drop off facilities to collect waste from currently un-serviced households and informal settlement</p>	<p>CAPEX/ OPEX – R4M</p> <p>OPEX</p>
	Develop and keep a record of complaints related to waste management within the municipality- Integration with the IT software system	Log complaints in a complaint safely controlled and secured complaint book	OPEX
	Develop and implement a waste management and fleet masterplan and investigate funding opportunities	Appoint a panel of service providers for the servicing trucks.	OPEX -at least 0.5% of the OPEX

Goal 3: Ensure that legislative tools are developed to deliver on the Waste Act and other applicable legislation			
Objectives	Targets	Alternatives	Budget
Promote good governance through the development and implementation of the Environmental legal tools	All by laws and policies reviewed	50% of all By-laws reviewed	OPEX – R250 000
Goal 4: Sound budgeting and financing of waste management services			
Objectives	Targets	Alternatives	Budget
Improve revenue collection from all waste management revenue streams	Optimise revenue collection from Commercial businesses operating within ELM.	Install alternative waste storage and collection facilities in identified business centres - static compactors for commercial businesses waste. Appoint data collectors to collect and consolidate data of all businesses operating within the municipality and implement tariff policy	CAPEX – R500 000 OPEX
	Optimise revenue collection from waste disposal at all municipal landfills using weighbridges	Estimation of waste disposed of Issuing of disposal permits	CAPEX – at least 6M installation and

		Appoint service provider for do reclamation of waste at all landfills	operationalisation of weigh bridges in all landfills REVENUE paid to the municipality
	Optimise revenue from all residential properties	Identifying households with extended families, backyard dwellings and boarding houses	OPEX – data collection
	Mass containers hiring charges adjustment	Repair of existing mass containers	R5M for acquisition of at least 200 mass containers
	Outsourcing waste reclamation	Formalisation of existing illegal recyclers	OPEX
	Revenue enhancement	All of the above	OPEX
Ensure sound budgeting for integrated waste management	The municipality must ensure that there is sufficient provision in the upcoming budget for the upcoming projects and action items		CAPEX/OPEX
	Review vacancies in the organogram and fill as required		OPEX

Goal 5: Ensure the safe and proper disposal of waste			
Objectives	Targets	Alternatives	Budget
Effective management and operation of the landfill site	All landfill sites to be operated by an external service provider	Procure landfill equipment to operate landfill in-house	OPEX -
Improve waste information management	Registering of waste generators, transporters and recyclers and enforcing compliance to the by-laws	Implement By-laws to ensure all waste handlers are registered	OPEX
	Improve waste information record keeping at all landfill sites	Utilise waste information officer/ landfill supervisor for the effective maintenance and safe keeping of landfill records	OPEX
	Installation of weighbridge at the Leeuwpoort and Phola Landfill sites	Estimation of waste entering the landfill	CAPEX – at least 6M installation and operationalisation of weigh bridges in all landfills
Goal 6: Education and awareness			
Objectives	Targets	Alternatives	Budget
Enhance public participation to ensure that the community takes ownership of	Conduct Clean-up campaign programme for all wards	Mayoral cleaning and greening project	OPEX

the environment through cleaning campaigns and greening programmes		Clean city program for illegal dumping areas	
	Utilise social media, local radio stations and notices as communication platform	Develop a plan/ or strategy for information dissemination	OPEX
	Conduct education and awareness campaigns	Conduct focus group talks with street traders, business and community members Establish an education and awareness unit	OPEX
Goal 7: Compliance and enforcement			
Objectives	Targets	Alternatives	Budget
Systematically monitor and enforce compliance with regulations, authorisation conditions and bylaws	Conduct annual, quarterly and monthly internal landfill audits	Compliance Officers to conduct internal landfill audits	OPEX
	Conduct annual external landfill audits	Appoint an external consultant to conduct external audits at all waste management facilities.	1.5M P/A

	Establish landfill consultative committees	Identify key stakeholders to communicate with re- on landfill matters	OPEX
	Conduct training for Peace officers	Utilise municipal land enforcement officers to enforce by-laws and conduct arrests	OPEX
	Ensure the training of officials as EMIs	Utilize EMIs from National and Province for matters which require the intervention of an EMI	OPEX
	Issuing of waste disposal and transportation permits issued	Law enforcement for non-compliance	OPEX
	Improve security and fencing at the landfill site to ensure that waste is safely disposed.	Install remote security measures at all landfills	OPEX

11.COMMUNICATION AND STAKEHOLDER PARTICIPATION

11.1. Consultation Process Summary

Stakeholder	Issues raised/ Concerns	Municipality's response	General comments
General members of the public			
Industries and Local businesses			
Political leaders			
Traditional leaders			
Youth Environmental Groups			
Taxi Association			
Recyclers CBOs			

12. LEGISLATIVE INSTRUMENTS

12.1 The Constitution (Act 108 of 1996)

All law, including environmental and waste management legislation, must comply with the South African Constitution (Act 108 of 1996).

Refuse removal, refuse dumps and solid waste disposal as well as cleansing is listed in Part B of Schedule 5 of the Constitution as a function of municipalities. Section 24 of the Constitution states that the people of South Africa have a right to an environment that is not detrimental to human health. The Constitution also stipulates that the state has a duty to impose legislation and to implement policies to ensure that the right defined in Section 24 is upheld. All departments of state or administration in the national, provincial or local levels of government have similar obligations. The principals of co-governance are also set out in the Constitution and the roles and responsibilities of the three levels of government are defined.

Refuse removal, refuse dumps and solid waste disposal as well as cleansing is listed in Part B of Schedule 5 of the Constitution as a function of municipalities. Hence the responsibility for waste management functions is to be devolved to the lowest possible level of government. Local government therefore is assigned the responsibility for waste management. Provincial government has the exclusive responsibility to ensure that local government carries out these functions effectively.

In addition to the Constitution, a number of government statutes and policies are relevant to waste management at the local government level, the most relevant of which includes the following:

- The Development Facilitation Act (67 of 1995)
- Local Government: Municipal Structures Act (117 of 1998)
- Local Government: Municipal Structures Amendment Act 2000 (plus multiple further amendments)
- Local Government: Municipal Demarcation Act (27 of 1998)
- Local Government: Municipal Systems Act (32 of 2000 - as amended)
- Local Government: Municipal Finance Management Act (56 of 2003)
- Environment Conservation Act (73 of 1989)
- National Environmental Management Act (107 of 1998)
- National Environmental Management Amendment Act (62 of 2008)
- National Environmental Management: Waste Act (59 of 2008)
- National Environmental Management: Waste Amendment Act (26 of 2014)

- National Environmental Management: Waste Act (59 of 2008): List of Waste Management Activities that has, or is likely to have a detrimental effect on the environment. Government Notice 37083, 29 November 2013 (as amended).
- National Environmental Management: Waste Act (59 of 2008) : National Domestic Waste Collection Standards, Government Notice 33935, 21 January 2011
- National Environmental Management: Waste Act (59 of 2008): National Waste Information Regulations, Government Notice 35583, 13 August 2012
- National Environmental Management: Waste Act (59 of 2008): Waste Classification and Management Regulations, Government Notice 36784, 23 August 2013
- National Environmental Management: Waste Act (59 of 2008): National Norms and Standards for the Assessment of Waste for Landfill Disposal, Government Notice 36784, 23 August 2013
- National Environmental Management: Waste Act (59 of 2008): National Norms and Standards for the Assessment of Waste for Landfill Disposal, Government Notice 36784, 23 August 2013
- National Environmental Management: Waste Act (59 of 2008): National Norms and Standards for the Remediation of Contaminated Land and Soil Quality: Government Notice 37603, 2 May 2014
- National Environmental Management: Waste Act (59 of 2008): National Norms and Standards for the Storage of Waste: Government Notice 3926, 29 November 2013
- National Environmental Management: Waste Act (59 of 2008): National Pricing Strategy for Waste Management
- National Organic Waste Composting Strategy, Final Strategy Report April 2013
- Municipal Solid Waste Tariff Strategy, DEA May 2012
- National Policy for the Provision of Basic Refuse Removal Services to Indigent Households, Government Notice 34385, 22 June 2011
- National Environmental Management: Air Quality Act (39 of 2004)
- National Water Act (36 of 1998)
- Occupational Health and Safety Act (85 of 1993)
- Health Act (63 of 1977)
- Hazardous Substances Act (15 of 1973)
- White Paper on Environmental Management Notice 749 of 1998
- White Paper on Integrated Pollution and Waste Management for South Africa of 2000
- Emalahleni Local Municipality Waste Management By-Laws (Provincial Gazette No. 2632, 13 January 2016)

Listed below is a short summary of the most relevant legislation pertaining to waste management and the preparation of this report.

12.2 National Environmental Management Act (107 of 1998)

The National Environmental Management Act (NEMA) provides for co-operative governance by establishing principles and procedures for decision-makers on matters affecting the environment. An important function of the Act is to serve as an enabling act for the promulgation of legislation to effectively address integrated environmental management. Some of the fundamental principles established in the Act are: - Accountability; Affordability; Cradle to Grave Management; Equity; Integration; Open Information; Polluter Pays; Waste Avoidance and Minimisation; Co-operative Governance; Sustainable Development; and Environmental Protection and Justice.

NEMA has been amended on a number of occasions since being promulgated in 1998. The most recent amendment is the National Environmental Management Amendment Act (Act 62 of 2008). This amendment act includes additional definitions as well as substitution of certain definitions.

The Environmental Impact Assessment (EIA) Regulations which aim to regulate the procedure relating to the submission, processing and consideration of, and decision on applications for environmental authorisations were published in 2006. The latest edition of these regulations was published in Government Notice 40772, 07 April 2017: National Environmental Management Act (Act 107 of 1998): Amendment to the Environmental Impact Assessment Regulations, 2014.

Section 24 and 44 of NEMA (as amended) makes provision for the promulgation of regulations that identify activities that would require environmental authorisation prior to commencing. The most recent edition of these listed activities has been published under the Amendment of the Environmental Impact Assessment Regulations Listing Notice 1, (2 and 3) of 2014, Government Notice 40772, 07 April 2017. It must be noted that in terms of Waste Management activities, these listing notices are supplemented by the relevant latest published List of Waste Management Activities that have, or are likely to have a detrimental effect on the environment published in terms of the National Environmental Management: Waste Act 2008 (Act 59 of 2008).

It must be noted that projects planned or referred to within this study may require Authorisation in terms of NEMA and Regulations, and cognisance must be taken of the timelines and procedural requirements.

12.3 Environment Conservation Act (73 of 1989)

The objective of the Environment Conservation Act (ECA) is to provide for the effective protection and controlled utilisation of the environment.

Part IV of the act introduced Control of Environmental Pollution. Waste Disposal Sites were formerly controlled through Section 20 of the Act by the issuing of Permits. Section 20 of the ECA was repealed by the promulgation of the Waste Act (59 of 2008). This applies to ELM as they operate landfills that have the appropriate permits issued in terms of Section 20 of the ECA. In terms of the Waste Act, these permits are still valid, but Waste Management Licences may be required in the future if significant further developments are planned.

In terms of the Section 19 of Part IV of the ECA, it is an offence to litter on any place to which the public has access and the person or authority in charge of the area must provide containers for the discarding of litter. In addition, every authority in control of any place must remove the litter within a reasonable time. Provision is made for the appointment of inspectors to investigate compliance with the ECA. In terms of Section 24A of the ECA, a competent authority may make regulations with regards to the control of the littering. ELM have imposed by-laws that deal with these offences as the requirements of this act

Environment Impact Assessment Regulations, regarding activities defined under Part V Section 21(1) of the ECA, were promulgated in Government Notice R1183 of 5 September 1997, and superseded Government Notice No R.982 of 4 December 2014 by the Environmental Impact Assessment Regulations, 2014. The promulgation of NEMA has resulted in most sections of the ECA being repealed.

12.4 National Environmental Management: Waste Act (59 of 2008)

The National Environmental Management: Waste Act (59 of 2008) (NEMWA) came into effect on 1 July 2009 and effectively repealed Section 20 of the ECA relating to the control of waste disposal sites. The National Environmental Management: Waste Amendment Act (26 of 2014) has subsequently been promulgated in which: - certain definitions are substituted or deleted, entities exempt from compiling Industry Waste Management Plans are clarified, establishing a pricing strategy and the establishing of a Waste Management Bureau; are introduced into legislation.

NEMWA (as amended) further defines the laws for all aspects of waste management, many of which have implications for Emalahleni Local Municipality. These are briefly described as follows.

Key definitions introduced by the NEMWA (as amended) are as follows:

“waste means -

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

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

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

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

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

Note that the NEMWA Amendment Act deletes the definitions of “by-product”, “building and demolition waste”, “business waste”, “domestic waste”, “general waste”, “hazardous waste”, and “inert waste”, and replaces these definitions with those extensively contained in Schedule 3 of the NEMWA Amendment Act, 2014.

“waste disposal facility” means any site or premises used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premises

“waste management activity” means any activity listed in Schedule 1 or published by notice in the Gazette, under Section 19, and includes-

the importation and exportation of waste;

the generation of waste, including the undertaking of any activity or process that is likely to result in the generation of waste;

the accumulation or storage of waste;

the collection and handling of waste

the reduction, re-use, recycling and recovery of waste;

the trading in waste;

the transportation of waste;

the transfer of waste;

the treatment of waste; and

the disposal of waste.

“General Duty of State”: *The Act requires that organs of state responsible for implementing the Act “must put in place uniform measures that seek to reduce the amount of waste that is generated and, where waste is generated, to ensure that waste is re-used, recycled and recovered in an environmentally sound manner before being safely treated and disposed of.”*

Chapter 2: Part 2 requires the Minister to set national norms and standards for the:

- classification of waste – see below: Waste Classification and Management Regulations, Government Notice 36784, 23 August 2013;
- planning and provision of waste management services – see below: National Domestic Waste Collection Standards, Government Notice 33935, 21 January 2011, and
- storage, treatment and disposal of waste, including the planning and operation of waste treatment and waste disposal facilities – see below.

Section 9 states that the municipality must exercise its executive authority to provide waste management services in a manner that complies with the national and provincial norms and standards drawn up by the Minister.

Chapter 3 of the NEMWA states that an Integrated Waste Management Plan (IWMP) must be drawn up and also described the contents on the IWMP. Section 11(4)(a)(i) requires that this IWMP must be submitted to the relevant provincial MEC for endorsement.

The NEMWA Amendment Act, 2014, contains Chapter 3A regarding a Pricing Strategy for waste management charges. This requires the Minister to publish a pricing strategy to achieve the objectives of the NEMWA. *A Discussion Document “National Pricing Strategy for Waste Management” was published on 2 February 2015 for comment.*

12.4.1 National Environmental Management: Waste Act (59 of 2008): List of Waste Management Activities that have, or are likely to have a detrimental effect on the environment. Government Notice 37083, 29 November 2013.

Section 19(1) of the NEMWA makes provisions for the Minister to publish a list of waste management activities that have, or likely to have, a detrimental effect on the environment. Section 20 states that no person may commence with or undertake these activities unless a waste management license is issued for those activities. As this applies to ELM should proposed or future waste management infrastructure development occur, this legislation outlines the process to be followed to obtain a waste management license.

This notice subdivides the activities into Category A, Category B and Category C.

Category A activities require a compilation of a Basic Assessment Report, as stipulated in the environmental impact assessment regulations made under section 24(5) of NEMA, as part of a waste management license application. ELM have proposed the development of three mini waste transfer stations, as per this regulation, Basic Assessments were undertaken in order to acquire waste management licenses.

Should a person wishing to commence or undertake any activity listed under **Category B** this will require undertaking of a full Environmental Impact Assessment process. Activities can only commence once a Waste Management License has been granted by the responsible authority.

Category C requires a person who wishes to undertake or conduct a waste management activity listed under Category C to comply with the relevant requirements listed. These include the Norms and Standards for Storage of Waste, 2013, which may have implications for Emalahleni Local Municipality in terms of certain of their waste management facilities.

It must be noted that this List of Waste Management Activities was amended in **Government Notice No 332 of 2 May 2014 – Amendment to the List of Waste Management Activities that have, or are likely to have a Detrimental Effect on the Environment**. The amendment essentially deleted the activity in Category A 3(8) which pertained to the remediation of contaminated land. **Further amendments were promulgated in July 2015** (where Residue Stockpiles from mines were included), **and October 2017**. This latest amendment removed the requirement for a Basic Assessment for waste recycling processing where the facility is under 1 000m² in area, and the introduction of the Norms and Standards for storage of waste; and the processing, handling and baling of General Waste; and the Standards for the extraction flaring or recovery of landfill gas; and scrapping or recovery motor vehicles. This applies for such facilities under certain threshold values.

12.4.2 National Environmental Management: Waste Act (59 of 2008): National Domestic Waste Collection Standards, Government Notice 33935, 21 January 2011

This notice aims to standardize waste service delivery to ensure that this service be 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 standards which are defined in this document are based on the principles outlined in **Section 2** of NEMA. The National Domestic Waste Collections Standards (NDWCS) also specifies that recyclables which are not collected at households should be deposited at drop-off centres which must be easily accessible to households. These drop-off centres must promote recycling, ensure user friendliness and also collection must be done at regular intervals so that it does not cause a nuisance.

The standards and regulations aimed for ensuring health and safety of Waste Collection Personnel are addressed in **Section 7** of this document. The NDWCS defines that there should be mechanisms in place to ensure that there be transparent communication between different stakeholders.

Section 8 of this document stipulates that the service provider must create awareness amongst households about waste collection services offered, source separation, composting and the consequences of illegal dumping.

This notice also outlines the role of the Waste Management Officer regarding waste awareness and the handling of complaints.

This has particular relevance to this IWMP as these NDWCS set the minimum standard to which ELM must deliver a domestic waste collection system, which is currently not being achieved. Accordingly, the specifications set out in the NDWCS will have to be incorporated into the models used to assess possible approaches to delivering a compliant system

12.4.3 National Environmental Management: Waste Act (59 of 2008): National Waste Information Regulations, Government Notice 35583, 13 August 2012

This notice presents the regulations for the collection of data and information to fulfil the objectives of the National Waste Information System set out in section 61 of NEMWA.

These regulations apply uniformly to all persons conducting an activity listed in Annexure 1 of this notice. A person who conducts an activity in a province that has established waste information system in terms of Section 62 of the NEMWA and collects the minimum information required by the regulations must submit the information to a provincial waste information system, or the South African Waste Information System.

Currently ELM do not fully comply with these regulations and do not submit accurate monthly waste quantities due to the non-operational of weighbridge facilities or suitable incoming waste quantification systems. This assessment will need to factor in capital to repair and operate this equipment at each of the landfills.

12.4.4 National Environmental Management: Waste Act (59 of 2008): Waste Classification and Management Regulations, Government Notice 36784, 23 August 2013

The purpose of this Regulation is to regulate the classification and management of waste in a manner which supports and implements the provisions of the 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.

Currently ELM does not effectively police the types of waste accepted from commercial and industrial waste generators, and does not have a system requiring such waste generators to classify their wastes according to this regulation prior to transport and disposal at their landfills.

It must be noted that the classifying of waste in terms of SANS 10234, is the responsibility of the waste generator, unless it is a waste listed in Annexure 1 of this Regulation. Amongst other responsibilities contained within this regulation, the waste generator may be required keep relatively detailed monthly records of classified wastes generated, re-used, recycled, recovered or disposed of, and by whom the waste was managed. If required, these records must be entered into the Waste Information System, and be available to the ELM designated Waste Management Officer.

Generators of hazardous wastes classified in terms of SANS 10234 need to keep a Waste Manifest documents system as detailed in these regulations, and must accompany any transport of these wastes to treatment or disposal. Accordingly, these documents should be copied to the ELM Waste Management Officer to effectively ensure that such wastes are being responsibly managed in accordance with all relevant legislation.

12.4.5 National Environmental Management: Waste Act (59 of 2008): National Norms and Standards for the Assessment of Waste for Landfill Disposal, Government Notice 36784, 23 August 2013

The purpose of the Norms and Standards is to prescribe the methodology for the assessment of waste prior to disposal to landfill in terms of Section 8(1) of the Waste Classification and Management Regulations.

The notice underlines the Standard Assessment Methodology to assess waste for the purpose of disposal to landfills and specifies that the following is required:

- Identification of chemical substances present in waste
- Sampling and analysis to determine the total concentrations (TC) and leachable concentrations (LC) of the elements and chemical substances that have been identified in the waste and that are specified in Section 6 of this Notice.

Within 3 years of the date of commencement of the Regulations, all analysis of the TC and LC must be conducted by labs accredited by SANAS. The TC and LC limits must be compared to the

threshold limits specified in section 6 of this notice. Based on the TC and LC limits the specific type of waste for disposal to landfill must be determined in terms of Section 7.

These regulations give effect to the methodology for the classification of wastes required by the Waste Classification and Management Regulations. The ELM Waste Management Officer must check that wastes that require classification are managed accordingly.

12.4.6 National Environmental Management: Waste Act (59 of 2008): National Norms and Standards for Disposal of Waste to Landfill, Government Notice 36784, 23 August 2013

These Norms and Standards determine the requirements for the disposal of waste to landfills as contemplated in regulation 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 presented in Table 27 below.

Table 27: Landfill Disposal Requirements as per Waste Type

Waste Type	Landfill Disposal Requirements
Type 0	Disposal to landfill not allowed
Type 1	Disposal at Class A landfill or H:h/H:H landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)
Type 2	Disposal at Class B landfill or G: L: B ⁺ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)
Type 3	Disposal at Class C landfill or G: L: B ⁺ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)
Type 4	Disposal at Class D landfill or G: L: B ⁻ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)

Waste listed in Section 2(a) of Annexure 1 to the Regulations must be disposed of as shown Table in the table below.

Table 28: Landfill Disposal Requirements for Listed Waste Types as per Section 2(a)

Listed Waste	Landfill Disposal Requirements
Domestic waste; business waste not containing hazardous waste of hazardous chemicals; non-infectious animal carcasses; garden waste.	Disposal at Class B landfill or G: L: B ⁺ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)

Post-consumer packaging; waste tyres.	Disposal at Class C landfill or G: L: B ⁺ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)
Building and demolition waste not containing hazardous waste or hazardous chemicals; Excavated earth material not containing hazardous waste or hazardous chemicals.	Disposal at Class D landfill or G: L: B ⁻ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)

Unless assessed in terms of the Norms and Standards for Assessment of Waste for Landfill Disposal set in terms of Section 7(1) of the Act and disposed of in terms of section 4(1) of these Norms and Standards, the following waste included in Section 2(b) of Annexure 1 to the Regulations must be disposed as described in **Table 29**.

Table 29: Landfill Disposal Requirements for Listed Waste Types as per Section 2(b)

Listed Waste	Landfill Disposal Requirements
Asbestos waste; Expired, spoilt or unusable hazardous products; PCBs; General waste, excluding domestic waste, which contains hazardous waste or hazardous chemicals; Mixed, hazardous chemical wastes from analytical labs and labs from academic institutions in containers less than 100litres.	Disposal at Class A landfill or H:h/H:H landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)

Waste that has been classified in terms of the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste (2nd Edition, Dept. of Water Affairs and Forestry, 1998) prior to the Regulations coming into operation, may be accepted and disposed of as set out in **Table 30** for a period not exceeding 3 years after the date of coming into operations of the Regulations.

Table 30: Landfill Disposal Requirements for Categorized Hazardous Waste Ratings

Waste	Landfill Disposal Requirements
Hazardous Waste – Hazard Rating 1 or 2	Disposal at Class A landfill or H:h/H:H landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)
Hazardous Waste – Hazard Rating 3 or 4	Disposal at Class A landfill or H:h/H:H landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)
Hazardous Waste – Delisted	Disposal at Class B landfill or G:L:B ⁺ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)

General Waste	Disposal at Class B landfill or G:S/M/L:B/B ⁺ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2 nd Edition, Dept. of Water Affairs and Forestry, 1998)
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The notice also lists prohibitions and restrictions on the disposal of waste to landfill which comes into effect after the timeframes indicated for each waste and activities from the date of Regulations coming into operation.

The landfills that ELM operate need to adhere to the requirements outlined within the Act. Also, the design and development of the new Leeuwpoot Landfill needs to adhere to this act.

12.4.7 National Environmental Management: Waste Act (59 of 2008): National Norms and Standards for the Remediation of Contaminated Land and Soil Quality: Government Notice 37603, 2 May 2014

These Norms and Standards give effect to Part 8 of the NEMWA which deals with remediation of contaminated lands. This publication aims to standardize the methodology for the assessment of contaminated lands as well as provide minimum standards for assessing necessary environmental protection measures for remediation activities. Chapter 2 of this publication illustrates the Soil Screen Values (SSVs) that contaminated sites must be remediated to. However, in instances which the compounds are not listed under Chapter 2, a remediation plan will have to be drawn up and indicate the levels at which contaminants will be remediated to.

Chapter 3 of these Norms and Standards outlines the general provisions that must be adhered. Aspects covered under this chapter include Access Control and Notices; Training; Emergency Preparedness Plans; Monitoring and Inspection as well as Auditing. As per this publication, any remediation activity/activities that will take more than 2 years to achieve the desired end state will be required to undertake bi-annual audits.

12.4.8 National Environmental Management: Waste Act (59 of 2008): National Norms and Standards for the Storage of Waste: Government Notice 3926, 29 November 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 to provide 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 requirement 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.

If ELM implements Buy-Back Centres for recycled materials that do not trigger the requirement of a Waste Management Licence, then these must conform to the Norms and Standards for the Temporary Storage of Waste.

12.4.9 National Environmental Management: Waste Act (59 of 2008): National Pricing Strategy for Waste Management

NEMWA allows for targeting of economic instruments to specific waste streams to serve as incentives or disincentives to encourage the change of behaviour towards the generation of waste and waste management by all sectors of society. The strategy contains guiding methodologies available for the setting of waste management tariffs aimed at funding re-use, recycling or recovery of waste in line with approved industry waste management plans for specific targeted waste streams.

While intended for implementation at industry level, this may have significant implications for the Emalahleni Local Municipality in terms of implementing their own recycling programs, waste collection and waste disposal volumes.

12.4.10 National Organic Waste Composting Strategy, Final Strategy Report April 2013

This strategy has been developed to strategize the potential of composting of suitable organic wastes, extracted from the municipal waste stream, as a method to beneficiate organic waste and help divert organics from landfill disposal.

12.4.11 Municipal Solid Waste Tariff Strategy, DEA May 2012

Although not a regulation, the purpose of this strategy is to provide a framework and guidance for municipalities in setting solid waste tariffs that align with the intentions of the National Waste Management Strategy (NWMS, 2011). The guideline is intended to implement full cost accounting of operational, maintenance and capital expenditure pertaining to compliant waste management services, leading to full cost recovery. It notes that under-pricing of waste

management services sends inappropriate signals to households and waste generators, and discourages waste minimisation, re-use and recycling.

The strategy supplies guidance in achieving the correct balance between appropriate subsidisation and full cost recovery.

As this document provides a guideline for determining tariffs for waste management, careful consideration of this document by ELM is required if detailed investigations into various recycling models are investigated as part of an implementation strategy.

12.4.12 National Policy for the Provision of Basic Refuse Removal Services to Indigent Households, Government Notice 34385, 22 June 2011

The National Policy on Free Basic Refuse Removal (FBRR) aims to address the need for free basic refuse removal among impoverished households. Many municipalities experience number of challenges with respect to delivering an effective and sustainable waste service to all households. Some of the problems currently experienced by municipalities in terms of waste management are insufficient budget allocation, lack of equipment, skilled staff and poor access to service areas.

There are 3 objectives of the National Policy on FBRR. The first, being to establish a framework for the development, identification and management of indigent households that can be enrolled for the FBRR service within the municipality. The second is to set broad principles, resulting in the adoption of bylaws for the implementation and enforcement of tariff policies that will support the FBRR service within the concerned municipalities. The last of these principals is to educate and raise awareness within municipalities regarding proper handling of domestic waste for FBRR as well as for the need to minimise waste and promote recycling.

Section 7 of this document defines the criteria for determining recipients that require FBRR services. The main criteria being that qualifying recipients requiring this service to be registered on a municipality's indigent register. Other criteria that can be used in the absence of being registered on a municipality's indigent register include level of income, residence status, special considerations, value of property as well as any other criteria as determined by the specific municipality.

The financing of FBRR services is dealt with in **Section 9** of this document. Under this chapter it is stipulated that the municipality must determine what the cost of providing a FBRR service. The required finance to implement such a service can be attained via internal sources (i.e.

revenues from local tariffs and other taxes levied), and external sources (i.e. from the national fiscus).

The Draft National FBRR Policy also states that upon implementation of the FBRR service, there should also be efficient monitoring. **Section 12** stipulates that the municipality must prepare an implementation plan for the FBRR services, and must contain aspects such as monitoring, targets and evaluation.

ELM offers basic waste management services to certain areas in which indigent communities resides. This refuse removal service should align itself to the requirements of the draft policy. Ultimately all indigent households should receive a basic waste removal service that aligns to this policy.

12.5 National Waste Management Strategy, Government Notice 35306, 4 May 2012

The National Waste Management Strategy (NWMS) is a legislative requirement of NEMWA. The purpose of the NWMS is to give effect in achieving the objectives outlined in NEMWA. Organs of state and affected persons are obliged to give effect to the NWMS. This document outlines the challenges that South Africa currently experiences with regards to waste management and states that waste management should move away from being uncoordinated to be managed and implemented in a more integrated, holistic manner.

NWMS is built around a framework of eight goals which, as per the strategy, needs to be achieved by 2016. These eight goals are listed as follows:

- Goal 1: Promote waste minimisation, reuse, recycling and recovery of waste
- Goal 2: Ensure the effective and efficient delivery of waste services
- Goal 3: Grow the contribution of the waste sector to the green economy
- Goal 4: Ensure that people are aware of the impact of waste on their health, well-being and the environment
- Goal 5: Achieve integrated waste management planning
- Goal 6: Ensure sound budgeting and financial management for waste services
- Goal 7: Provide measures to remediate contaminated land
- Goal 8: Establish effective compliance with and enforcement of NEMWA

Chapter 4 of the NWMS deals with the mechanisms necessary to implement this strategy. This chapter also outlines the roles of different tiers of government as well as private and public sector in the implementation of the NWMS.

The NWMS 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.

The goals outlined in the NWMS needs to be achieved ELM. This assessment aims to aid the realisation of these goals being achieved, ultimately upgrading the level of waste management services within ELM to comply with the Waste Act, Regulations and applicable Norms and Standards

12.6 National Environmental Management: Air Quality Act (39 of 2004)

This National Environmental Management: Air Quality Act (NEMAQA) aims to protect the environment by providing reasonable measures for the protection and enhancement of the quality of air as well as for the prevention of air pollution and ecological degradation. Chapter 2 of the act stipulates the establishment of a national framework to achieve the objects of the act. This national framework will contain aspects of ambient air quality standards as well as national norms and standards on air quality management. This act also outlines the contents of air quality management plans and also the procedure to be followed for the application of atmospheric emission license.

Section 21(1)a of NEMAQA stipulates that the Minister must publish a list of activities that will have significant detrimental effects on the environment. This list was published in the following document:

List of Activities Which Result in Atmospheric Emissions Which Have or May Have A Significant Detrimental Effect on The Environment, Including Health, Social Conditions, Economic Conditions, Ecological Conditions or Cultural Heritage (GNR 248, March 2010) as amended.

This document contains the minimum emission standards for cement production using alternative fuels and/or resources (AFR). This is an important aspect in terms of waste management because thermal waste treatment can be implemented during cement production. This involves the use of waste as an AFR in the cement production process.

This act applies to waste management activities involving the thermal treatment of waste or the production of AFR, which could possibly be implemented in the future as an alternative to landfilling of untreated waste

12.7 Local Government Transition Act (209 of 1993)

The Local Government Transition Act 209 of 1993 provides for interim measures to local government prior to final arrangements of restructuring being implemented. Section 10 (C) sets out the powers and duties of Metropolitan Councils and Metropolitan Local Councils. Many of these powers and duties of Metropolitan Councils are of relevance to waste management. In particular, ELM is empowered to produce an Integrated Development Plan, which is a plan aimed at the integrated development and management of its area of jurisdiction. This will include service delivery aspects concerning waste management and waste disposal strategy, the identification of sites for the placing of waste disposal facilities and the establishment, operation and control of waste disposal sites.

12.8 Municipal Demarcation Act (27 of 1998)

The Municipal Demarcation Act provides criteria and procedures for the determination of municipal boundaries by an independent authority. In terms of the Act, the Municipal Demarcation Board is established to determine municipal boundaries.

Section 24 provides that when demarcating a municipal boundary, the Board must aim to establish an area that would enable the municipality to fulfil its Constitutional obligations, including the provision of services in an equitable and sustainable manner, the promotion of social and economic development and the promotion of a safe and healthy environment. The tax base must also be as inclusive as possible of users of municipal services in the municipality.

12.9 The Development Facilitation Act (67 of 1995)

The Development Facilitation Act sets out a planning and land development system, which ensures that national, provincial, and local government policies are implemented. Section 28 describes the requirements for Land Development Objectives, which must be developed by each local authority. One of the objectives of Land Development Objectives is to create a new system of planning that encourages sustained utilisation of the environment, particularly with regard to the environmental consequences of developments. Municipalities are encouraged to co-operate in order to develop the capacity of each municipality to exercise its powers and duties and manage its affairs. This will apply to future proposed waste management facilities that ELM plan to develop, which implies that the possible locations for these should meet the Land Development Objectives and be considered timeously in land use planning initiatives.

12.10 National Water Act (36 of 1998)

The National Water Act (NWA) contains a number of provisions that impact on 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 NWA allows the Minister to make regulations for:

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

The NWA requires that waste discharged or deposited into or allowed to enter a water resource be monitored and analysed according to prescribed mechanisms. All ELM waste management operations and facilities need to comply with the NWA.

12.11 Occupational Health and Safety Act (Act 85 of 1993)

The Occupational Health and Safety (OHS) Act delegates significant responsibilities to the Chief Executive Officer of an organisation, and employees of an organisation, regarding the health and safety of the operations undertaken by the organisation. In the case of ELM, the municipality must ensure a safe working environment particularly for waste collection and disposal employees where significant risks are present in their working environment. It is a requirement of the OHS Act that risk assessments are undertaken for all their operations, safe procedures developed, and sufficient on-going training in these safe procedures is implemented. All plant and machinery utilised in these waste management operations must be serviced and maintained in safe operating condition fit for purpose, and form part of these procedures.

Although largely considered beyond the scope of this assessment, it is evident that all workplaces and operations, including plant and equipment shall comply with the OHS Act as a minimum requirement, and built into all future ELM waste management operations.

12.12 Health Act (63 of 1977)

The Health Act provides measures for the promotion of health, for the rendering of health services and defines duties of certain authorities which render health services in the Republic. Section 20 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. Draft regulations for the control of environmental conditions constituting a danger to health or a nuisance were published in GNR21 of 14 January 2000.

In terms of the proposed regulations, registration is required for: concerns that to carry out a scheduled trade, including waste incineration, waste (including medical waste) disposal sites and waste collecting, sorting, treating or processing sites. All health facilities are required to produce a medical waste management plan. There are numerous health facilities found within ELM that need to be accountable for how medical waste is being disposed appropriately.

12.13 Hazardous Substances Act (15 of 1973)

This legislation aims to address substances that are deemed hazardous, in order 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 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.

ELM waste management division deals with non-hazardous waste only. Private organisations that specialise in hazardous waste handle hazardous waste within the municipality. However, there are instances of hazardous waste entering general landfills which needs to be addressed.

12.14 White Paper on Environmental Management (Notice 749 of 1998)

The White Paper on Environmental Management was published in 1998. This policy sets out government's objectives in relation to environmental management, how it intends to achieve its objectives, and to guide government agencies and organs of state in developing strategies to meet their objectives. The policy document is an overarching policy framework that refers to all government institutions and to all activities that impact on the environment.

The policy states that government will allocate functions to the institutions and spheres of government that can most effectively achieve the objectives of sustainable development and integrated environmental management. This would include the allocation of certain functions to the municipal sphere of government. Where appropriate, provincial and local government

are to develop their own legislation and implementation strategies to address their specific needs and conditions within the framework of the policy.

This integrated environmental management approach has been carried over to waste management that needs to be adopted by all waste management service providers.

12.15 White Paper on Integrated Pollution and Waste Management for South Africa of 2000

The White Paper on Integrated Pollution and Waste Management for South Africa serves to inform the public of the government's objectives towards integrated pollution and waste management as well as how the government intends to achieve these objectives. This document also intends to inform government agencies and State organs of these objectives, and their roles in achieving them. It also illustrates the shift from the way waste management was dealt with previously, mainly tackling post-consumer waste, towards a newer more holistic approach of waste management. This document also encourages the amalgamation of all existing legislations pertaining to waste management and pollution into a single piece of legislation dealing with all waste and pollution matters.

12.16 Local Government Legislation

12.16.1 Local Government Municipal Structures Act (117 of 1998) (As amended)

This Act enables the formation of, and outlines the duties and functions of District and Local Municipalities. Of pertinence is Section 83 that details the services that must be delivered by a municipality. In particular general waste management is the responsibility of a local municipality, except for where a district municipality may deliver a district wide waste disposal service.

12.16.2 Local Government: Municipal Systems Act (32 of 2000) (As amended)

The Municipal Systems Act describes the core principles, mechanisms, and processes that are necessary to enable municipalities to move progressively towards the social and economic upliftment of communities and ensure access to services that are affordable to all. Its focus is primarily on the internal systems and administration of the municipality.

The Act enables the process of decentralisation of functions through assigning powers of general competence to local Government. Municipal by-laws are regulated to achieve harmony with national and provincial legislation. As service authorities, municipalities remain responsible for the effective delivery of services and must provide an appropriate policy and

regulatory framework. This can be achieved through the most appropriate service provider, ranging from internal departmental delivery to corporatisation and joint ventures to private sector delivery options. Performance management systems are to be developed to measure and evaluate performance in priority areas, which are to be reported annually to citizens and other spheres of government. The process to be followed in planning, drafting and adopting the Integrated Development Plan is set out.

Section 78 of this act outlines criteria and process for determining mechanisms to provide municipal services, which is the core to this solid waste assessment. This study will take into consideration the requirements outlined in this section and evaluate internal verses external services.

Section 76 outlines the possible mechanisms of delivering a service, either through an internal or external mechanism. This is augmented by Section 77 which details that a municipality must review and decide on the appropriate mechanism to provide such a service if, amongst other reasons, a service is to be significantly upgraded or improved. Section 78 lists the procedure that must be followed to undertake this review. This report has been prepared in terms of Section 78 of the Municipal Structures Act 32 of 2000, as amended.

12.16.3 Local Government: Municipal Finance Management Act 56 of 2003

Section 120 of this Act lists the conditions under which a Public Private Partnership may proceed, and presents the process that must be followed if ELM were to consider such an approach.

12.16.4 Emalahleni Local Municipality Waste Management By-Laws (Provincial Gazette No. 2632, 13 January 2016)

Emalahleni Local Municipality gazetted comprehensive Waste Management By-Laws in January 2016. The following is a brief review of these by-laws against the *Model By-Laws on Waste Management issued by the Chief Directorate: Pollution and Waste Management in November 2011* (Model By-Laws 2011).

Chapter 1: Definitions, Objectives and Principals

The promulgated by-laws are largely those as presented in the Model By-Laws 2011, and adequately serve the purpose intended. Of positive significance is that many more waste management terms are defined.

Chapter 2: Waste Management Information System

The Model By-Laws 2011 recommend that any person who conducts an activity that requires registration with the national waste information system must, upon request present proof that

the activity is registered, and reporting the required information. The Model By-Laws then state that the municipality may effectively introduce their own waste information system that requires a waste producer to register and report any other information. The Emalahleni Local Municipality by-laws allow for the formation of a waste information system

Section 3 of the National Environmental Management Act: Waste Act, 2208 (Act No 59 of 2008): National Waste Information Regulations (R 625, 13 August 2012) requires the registration of all persons conducting an activity listed in Annexure 1 of the Regulation with the South African Waste Information System. It only exempts such waste producers from registration with SAWIS if they register with a Provincial waste information system that is compatible with SAWIS. It must therefore be noted that any municipal waste information system does not absolve such waste producers from registering and reporting to SAWIS. It is recommended that if the Emalahleni Local Municipality institutes a waste information system, it is configured only to obtain the minimum of information required to effectively manage waste in the Emalahleni Local Municipality area, and collects only information that SAWIS requires, so as to prevent an “administration overload” on the waste producer.

Chapter 3: General Duties (NOTE: In the Gazette index this section is listed as “Municipal Services”

This section clearly describes in some detail the duties and responsibilities of both the Municipality and waste generators, and the conditions upon which the Emalahleni Local Municipality to differentiate between categories and geographic location of waste producers, the types of waste that Emalahleni Local Municipality may collect, and the level of service delivered. It also obligates the waste producers to pay an appropriate fee according to the level of service provided.

In this respect the Emalahleni Local Municipality By-Laws are more effective than the Model By-Laws 2011.

Chapter 4: Service Providers

The Emalahleni Local Municipality By-Laws are identical to those recommended in Chapter 2 of the Model By-Laws 2011, and are considered adequate.

Chapter 5: Commercial Services

This chapter exceeds the recommended provisions in Chapter 10 of the Model By-Laws 2011. It requires any commercial waste management service providers to register with the Emalahleni Local Municipality. It notes that only “certificate” holders (See Chapter 11) may provide commercial services.

Further, the waste producer utilising commercial service providers is to properly store their waste and/or recyclable materials in an acceptable manner until collection. It requires the service provider to collect such wastes/recyclables within a reasonable time after generation, such that impacts are minimised. Such wastes/recyclable materials may only be delivered to appropriately licenced facilities.

However, the Emalahleni Local Municipality By-Laws state in Chapter 5 Section 14(7) that the “*municipality may require any person or category of transporters to register and report to the Municipality....*” It is not known whether a registration or Certificate of Approval (See Chapter 11) has been implemented yet.

Chapter 6: Garden Waste, Bulky Waste and Building Waste

The Emalahleni Local Municipality By-Laws clearly present how these wastes are to be stored, handled and disposed of, and are identical to Sections 23, 24 and 25 of the Model By-Laws 2011.

Chapter 7: Industrial, Hazardous and Health Care Risk Waste

The Emalahleni Local Municipality By-Laws contain all 3 clauses in Section 26 of the Model By-Laws 2011.

The Emalahleni Local Municipality By-Laws expand on these by adding that no activities that produce such wastes may be commenced without notifying the Municipality in writing with relevant details of wastes to be generated. If the activity commenced prior to these by-laws, the waste generator needed to notify the municipality within 6 months of the date of the by-laws. It is not known if this Clause is implemented or monitored by Emalahleni Local Municipality.

The Emalahleni Local Municipality By-Laws also include details and conditions regarding the transportation and disposal of such wastes. It must be noted that persons authorised to collect and dispose of such wastes is to inform the municipality with details prior to the date of collection. Again, it is not known if this is implemented or monitored by Emalahleni Local Municipality.

Chapter 8: General Provisions

Littering and Prohibition of Littering: Emalahleni Local Municipality By-Laws include a specific provision for street refuse bins that limits the use of such bins to pedestrians, and excludes the use for placing of domestic or business wastes. Further, it contains provisions for prohibiting the damage of, or placing notices, advertisements or stickers on such bins. The

by-laws allow for the provision of bins by private persons or institutions with prior written approval.

Chapter 10: Transport and Disposal of General Waste:

Transportation of General Waste: The Emalahleni Local Municipality By-Laws stipulate that only suitable type vehicles may be used to convey waste, must maintain such vehicles, and that open vehicles conveying waste must be covered.

Disposal of General Waste: General wastes generated within the Emalahleni Local Municipality must be disposed of at a licenced facility. All persons disposing of at such a facility must adhere to the site operating procedures, and pay any tariff approved by the Emalahleni Local Municipality. Although the by-laws contain further provisions, these should also form part of the licenced waste management facility's operational procedures. It is not known if such operational procedures, in the form of a Landfill Operating Plan, have been prepared and implemented at the Emalahleni Local Municipality landfills.

Chapter 11: Certificate of Approval

The Emalahleni Local Municipality By-Laws provide for the establishment of a Certificate of Approval to register persons who wish to collect or transport business (bulk containerised) waste, industrial waste, recyclable waste or building waste. The by-laws stipulate the application process, the adjudication process, the certificate terms and conditions, the renewal process, and the display of the certificate on each vehicle to be utilised. A Transitional Provision and Exemption clause allows for any person lawfully providing a commercial service when a notice to establish a certificate of approval system is issued, to continue the service but must applying for certification.

Chapter 12: Administrative Enforcement Provisions

This chapter of the Emalahleni Local Municipality By-Laws presents in detail the administrative processes that may be implemented to enforce these by-laws. It covers the designation of authorised officials, the powers to execute work and inspect vehicles and premises and the powers to question. If/when a certification system is implemented, it details the supervision of the certification system. The by-laws empower an authorised official to issue enforcement notices, and to receive and act on complaints. The by-laws allow for the establishment of an administrative penalty system, issue and administer infringement notices.

Chapter 13: Judicial Enforcement Provisions

The Emalahleni Local Municipality By-Laws provide a list the waste management offences that may liable for fine or in default of payment a prison term. It notes that if a person is unable to afford the fine, they shall be liable for a period of community service.

Chapter 14: General Provisions

Section 57 notes that “the owner of a business premises shall accept full responsibility with regard to the public appearance of a pavement in front of his premises”. While laudable, it is not clear in terms of property law and other legislation whether this is enforceable.

Section 59 clarifies that ownership of waste disposed or transported is deemed to have passed to the persons holding the waste management licence for disposal, or the certified transporter of the waste. Similarly, the ownership of domestic waste passes to the municipality once it is placed in an approved receptacle, and placed outside the premises for collection. This is essentially necessary in order for any municipal or municipal endorsed waste service provider to enable recycling or re-use of such materials. This also enables clarity on the transporter’s responsibilities in other sections of the by-laws.

The remaining sections of this chapter pertain to the discontinuation of requiring waste management services at premises, legal addresses required for service of documents, process and notices.

The Emalahleni Local Municipality By-Laws officially repeal the previous 2008 by-laws.

General Statement: The Emalahleni Local Municipality By-Laws 2016 are an effective framework for the implementation and operation of an effective waste management system within the Emalahleni Local Municipality area.

Implementation Plan (Summary of an IWMP Planning

Situation Analysis	Desired end state (Goals)	Targets	Y1	Y2	Y3	Y4	Y5	Selected alternatives	(Implementation mechanisms) Resources		
									Human Resource (HR)	Equipment (EQP)	Finance (HR+EQP)
All waste going to waste disposal facilities	Goal 1: Create a sustainable recycling and reuse culture within the municipality including developing infrastructure for recycling.	To achieve 15% of recyclables by 2025 and 30% by 2030	5%	7.5%	10%	12.5%	15%	Formalisation of existing informal recyclers. Appoint a service provider for reclamation of waste at all landfills Utilise the waste information system officer/ landfill supervisors to collect waste recycling information and maintenance of records on recycling	Education and awareness officials to be appointed	Laptops Education and Awareness tools Transport	3% of the total operational budget
		Pilot the separation at source at affluent			✓			Benchmarking with other municipalities on recycling at source, alternatively, identify or appoint a	As above	As above	3% of the total operational budget

		residential complexes						service provider to facilitate/ conduct recycling at source.			
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Situation Analysis	Desired end state (Goals)	Targets	Y1	Y2	Y3	Y4	Y5	Selected alternatives	(Implementation mechanisms) Resource		
									Human Resource (HR)	Equipment (EQP)	Finance (HR+EQP)
Some of the households are not receiving waste management services	Goal 2: (a)Create a sustainable culture in the handling, transportation and disposal of waste. (b)Provide a minimum level of service to un-serviced areas	Deliver effective and efficient services to 102 829 plus 8355 new households.	✓	✓	✓	✓	✓	<p>Ensure the repair of existing mass containers</p> <p>Provision of services through bulk mass container system where resources are limited</p> <p>Establishment of communal collection points or mini-drop off facilities to collect waste from currently un-serviced households and informal settlements</p> <p>Develop and implement a waste management and fleet master plan and investigate funding opportunities</p>			At least 10% of the total operational budget

								Log complaints in a complaint book that is safely secured and controlled. Develop an IT system to log in complaints and monitoring.			
There is no efficient waste management by-laws and systems in place	Goal 3: Promote good governance through the development and implementation of environmental legal tools	Develop a strategy for the collection of waste services						Review the Integrated Waste Management Plan and the Environmental Management Policy			
		Review waste management by-laws, policies and strategic documents		✓				50% of By-laws reviewed/developed. All relevant policies reviewed/ developed All strategic documents reviewed			R250 000
The budget is not ring fenced and there are no proper mechanism for cost recovery for the services rendered	Goal 4: Improve revenue collection from all waste management revenue streams	Sound budgeting and financing of waste management services						Ensure provision of a cost reflective budget by conducting a full cost accounting for waste services			

		Optimize revenue collection from commercial businesses operating within ELM						Set and implement cost reflective tariffs for waste collection and disposal. Installation of alternative waste storage and collection facilities. Appoint data collectors to collect and consolidate data of all businesses operating within ELM and implement tariff policy. Appoint data collectors to collect and consolidate data of all residential properties with extended dwellings or backyards and implement revised tariffs for waste collection and disposal			
		Optimize revenue collection from waste disposal at all municipal landfills using weighbridges						Implement waste disposal tariffs Estimation of waste disposal at landfills without weighbridges Issuance of disposal permits			

The municipality is operating an unlicensed waste disposal facility and the waste disposal facility is not managed in an environmentally sound manner	Goal 5: Effective management and operation of all landfills Effective management of illegal dumping in informal areas, waste in public gathering and public open spaces as well as street cleansing.	Establish a new centralized waste disposal facility									
		Appoint an external service provider to operate landfills Installation of weighbridges across all landfills Registration of all large generators and transporters of waste									
		Train the waste disposal facility manager/oper									

Procure landfill equipment and train operators to operate landfill sites in-house.

Estimation of waste volumes where there are no weighbridges

Law enforcement on unlicensed transporters and large generators of waste.

		<p>security to police the landfills</p> <p>Law enforcement by compliance officers/ law enforcement officer's non-compliance</p> <p>Implement a waste to energy project at Leeuwpoot landfill</p>						Utilise Local and Provincial EMIs for law enforcement			
The municipality does not have education and awareness programme or strategy in place	Goal 6: Education and awareness	<p>Establish an education and awareness unit.</p> <p>Utilise social media platforms, radio slots and public notices as</p>						<p>Conduct clean up campaigns</p> <p>Encourage public participation through the Adopt a Spot program</p> <p>Conduct focus group talks on good waste management practices.</p>			

		communicatio n platforms						Implement ward based cleaning and Greening projects Establish platforms where public complaints and awareness messages can be disseminated.			
		Develop an education and awareness strategy						Design/ source educational material on waste management			
		Develop a school's competition programme to encourage school's involvement on waste management issues i.e. recycling									
Inadequate law enforcement	Goal 7: Compliance and enforcement	Appoint officials to enforce by- laws									

		Enforce by- laws										
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13. Reporting on Monitoring

Regular and ongoing monitoring of the Implementation Plan is required to ensure the goals, objectives and targets of the IWMP are accomplished within designated timeframes.

REPORTING

According to Section 13(2) of The National Environmental Management Waste Act (Act 59 of 2008), performance reports on the implementation of the integrated waste management plan must be prepared in terms of Section 46 of the Municipal Systems Act and must contain the following information:

-  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.

MONITORING AND REVIEW

To ensure that the IWMP remains up to date as far as practically possible and stays relevant, it must go through a review process. This process will be initiated and followed by the IWMP advisory committee. The committee will review the proposed projects and implementation items contained in the IWMP.

The designated Waste Management Officer (WMO) is responsible for preparing the performance reports on the implementation of the IWMP on an annual basis. The Annual Performance Report must summarise the municipality's progress towards meeting the goals, targets and objectives outlined in the Implementation Plan of the IWMP. More specifically, the Report should comprise of the following:

- 
Strategic Issues: The BVM's performance and progress on meeting the short, medium- and long-term goals, objectives and targets;
- 
Financial Issues: Reporting on budget forecasting, obtaining sufficient budgets and budgeting constraints with respect to both existing waste management operations and the implementation of this IWMP;
- 
IWMP Amendments: Amendments to the IWMP necessitated by the outcomes of feasibility studies, financial constraints etc; and
- 
Communication: Keeping councilors, key stakeholders and the residents informed on the progress in meeting the IWMP.

13.1 Strategic issues

The over-achieving goal is to develop an effective IWMP, which aspires to reduce generation and environmental impact of all forms of waste, so that the socio-economic development of Emalahleni, the health of its populace and the quality of its environmental resources will no longer be adversely affected by uncontrolled and uncoordinated waste management. The desired strategic outcomes prior to the IWMP can be outlined as follows:

- Provision of a more effective and efficient service
- Implementation of effective Waste Information System
- To ensure legal compliance, improved landfill facilities and their operation therein
- To provide an integrated waste management strategy combining all methods of waste management with regard to the waste management hierarchy concept
- To optimistically reduce the amount of waste which is currently disposed
- To encourage and concurrently increase waste minimization and recycling tendency
- To treat and dispose off all the waste within Emalahleni, and
- Minimization of adverse environmental and social impacts related to waste management and thereby improve the quality of life for all the inhabitants of Emalahleni Local Municipality
- Green Municipality towards a green economy

13.2 Performance

The IWMP is a living document which has to be reviewed on an ongoing basis. An IWMP is intrinsically linked to the IDP hence its review cycle should be aligned with that of the IDP process. An IWMP is ideally reviewed every 5 years. An annual update is however encouraged to ensure that the IWMP remains relevant and effective. This will also facilitate the updating of the IWMP in view of the targets set in the plans/strategies/policies as per the Action Plan developed in this IWMP.

13.3 Public accountability

Households and industry shall avoid negative impacts from waste on the environment and also play a role in terms of separation of waste at source, waste exchange and cleaner production.

Changes in consumption patterns will reduce generation of waste and save our precious non-renewable natural resources.

In terms of waste avoidance and minimization, the cooperation and additional effort of the manufacturers and producers in terms of “Cleaner Production and Sustainable Consumption” and “Extended Producer Responsibility” (EPR) initiatives, and participation by the consumers of goods as part of individual waste minimization effort is required. In this regard the responsibilities of residents, visitors or entities inside the urban boundaries include the following:

- All stakeholders must avoid generating waste as far as possible
- All residents, property owners, government departments, non-governmental or community service organisations, and business entities handling waste must be registered with on the Emalahleni Waste Information System
- All entities and individuals wishing to engage in commercial waste minimization and recycling activities inside urban areas that will divert waste from landfill must be accredited and licensed by Emalahleni to operate in the urban areas.
- All events organized and hosted in Emalahleni must have a waste management plan that includes source separation and a provision for the cost of associated waste management services.
- Industrial and health care entities must have a contract with a legitimate private sector service provider able to provide a service according to the nature of the waste that must be collected, and/or treated, and/or recycled, and/or disposed.
- The occupant of a dwelling or property, manager of a facility, amenity or a business entity, or entrepreneur that generates waste, must ensure that recyclable waste is separated and stored in an approved container.
- The waste generator must transport recyclables or have these collected at own cost to a specially provided facility, where the recyclable materials must be placed in separate bulk containers or a separate area provided at the facility.
- Property owners of vacant land and occupants of occupied property are responsible for maintaining cleanliness and hygiene standards inside the boundaries of the property in terms of Emalahleni applicable by-laws.

- Emalahleni Local Municipality reserves the right to clean waste and overgrowth that accumulates on such land at the owners expense at the cost of cleaning and disposing of the waste
- Property owners and/or developers of land and buildings must provide for waste management infrastructure according to Emalahleni guidelines, and must submit a waste management plan as part of the Emalahleni Local Municipality plans approval process.
- All relevant stakeholders in terms of the Action Plans set in this plan must develop operating plans and ensure reporting on progress of implementation of the plan to the Environmental and Waste Management Directorate.

13.4 Communication and public participation plan

Awareness-raising and education are an integral part to a successful waste management process. Communication on the implementation of the IWMP and its implication to behavioural change, especially behaviour relating to illegal dumping, burning and burying of waste as a waste minimization strategy, has to be strengthened within the Municipality.

There is generally a lack of awareness about the requirements of the law in relation to the Cradle to Grave Principles of Waste Management. Awareness of legal implications of illegal dumping of waste is also of concern to both the health and wellbeing of the community including their surrounding environment. The awareness through educational campaigns is very important to inform, educate and transfer knowledge thereby empowering the community with information related to best practice in relation to waste management and environmental protection. This process is important even during the development of by-laws to ensure that communities are aware when the by-laws are enforced and the implications of non-adherence.

In compliance with the Municipal Systems Act and the NWMS, the Integrated Waste Management Plan is developed in consultation with stakeholders. A list of key stakeholders will be in consultation with stakeholders will be in consultation with stakeholder and local communities, the participant will include:

- Ward Councillors
- Members of the Local Council
- Regional DWS office
- Business and Industry
- Community Members
- Provincial COGTA
- DARLEA (Mpumalanga)
- Nkangala District Municipality

- Non-governmental organizations

Stakeholder meetings will be conducted for the duration of the development of the final IWMP

The consultative stakeholder workshops will be planned well in advance, with invitations to participants, workshop agendas and documents forwarded to key stakeholders at least two weeks prior to the workshop. A record of workshop proceedings will be kept, with comments made during the sessions well documented for record purposes. The workshop facilitation process will be conducted in an interactive and participative manner, allowing stakeholders the opportunity to discuss and debate relevant issues pertaining the IWMP.

13.5 Financial plan

The Emalahleni Local Municipality has several resources options available for the implementation of the various recommendations. The first is resources from the Municipal Revenue budget.

A second option available is in the form of Municipal Infrastructure Grant (MIG). This MIG grant is from the National Government and is generally applicable to the infrastructure buildings within a Municipal area, but waste equipment may be considered.

Thirdly, funding is made available through Equitable Shared Grant provided by Treasury mainly to provide free basic services to indigents particularly electricity, water and refuse removal.

The implementation plan represents the ideal or complete solution for waste management within Emalahleni.

Due to the fact that Emalahleni Local Municipality at the moment does not have financial resources to implement all of the recommendations it is essential that the Municipality prioritize the recommendations and actions.

The breakdown of the tasks according to priority and responsibility:

Focus Area	Priority	Requirements/Responsibility
Infrastructure	Continue to operate Leeuwpoort/Ga-Nala/Phola landfill sites in accordance with the minimum	Municipality

	requirements and permit conditions	
	Identify licence and construct a second-phase of Leeuwpoort landfill site	Municipality
	Identify and construct a Transfer Station suitably located to service the unserved areas (Empumelelweni)	Municipality
Waste Collection Infrastructure	Standardise collection and optimise collection routes	Municipality
	Complete fleet replacement plan and implement savings plan. Replace existing old vehicles and purchase additional waste collection vehicles.	Municipality
Human Resources/Corporate Services	Appoint additional permanent personnel	Municipality
	Continuous training by HRD	Municipality
Management of illegal dumping sites	Review By-Laws on a regular basis	Municipality
Community awareness	Community awareness and community watch	Municipality
Dissemination of Information	Continue reporting to SAWIS	Municipality
Waste Minimization	Continue to extend current initiatives by promoting recycling and community awareness	Municipality
	Develop garden refuse strategy and investigate feasibility to establish composting facility	Municipality

13.6 Waste Management Implementation Programme

Focus Area	Recommendation	Action				
		2023/2024	2024/2025	2025/2026	2026/2027	2027/2028
Waste Disposal Infrastructure	Develop a second phase for Leeuwpoot landfill site		Appoint a Consultant	Appoint a Consultant	Construct a second phase in accordance to approved design plan	Completion
	Identify and construct a Transfer Station in Empumelelweni			Compile design plan for Transfer Station	Construct Transfer Station in accordance with approved design plan	Audit Management of Transfer Station
	Proposed Budget		MIG/SLP	MIG/SLP	MIG/SLP	MIG/SLP

13.7 Revision of the IWMP

As this IWMP forms part of the Integrated Development Plan required in terms of Chapter 5 of the Municipal Systems Act, the next comprehensive version of the IWMP should occur in 2028.

The comprehensive review will update the status quo, evaluate overall progress against the goals, objectives and targets outlined in the IWMP, review gaps and needs, and reformulate the goals and objectives as required to continue to improve waste management services in the ELM.

13.8 Revision of the IWMP

The purpose of this report is to analyse and quantify all aspects related to waste management services and practices carried out by the ELM with the view of using such information as a baseline for future planning.

In terms of Waste Management Service delivery, the ELM provides weekly waste collection services to all formal and business, including mass container usage to informal settlements. The ELM does not have drop-off facilities and an operational composting facility, except two newly developed Solid Waste Transfer Stations in Reyno Ridge and Schoongezicht. The ELM has 3 operational landfill sites namely: Leeuwpoot Landfill Site, Ga-Nala Landfill Site and Phola Landfill Site.

The analysis of the current Waste Management System have led to the identification of gaps and needs and these are addressed with the overachieving goals, objectives and targets.

The main goals for Integrated Waste Management in ELM can be summarized as follows:

- To ensure effective solid waste service delivery
- To provide waste minimisation and recycling
- To improve waste education and public awareness
- To ensure sound budgeting for integrated waste management
- To improve regulatory compliance, and
- To improve Waste Information System Management

For these goals to be met, a series of implementation instruments (Action Plans) will need to be implemented.

As part of the development of the IWMP, the Municipality will engage with stakeholders and members of the community.

Stakeholders, interested and affected parties (I+APs) will be invited within the jurisdiction of the Municipality that the draft IWMP is out for commenting. The comments on the draft IWMP will be incorporated into the final ELM IWMP.

13.9 REFERENCES

- IDP 2022-2027 Integrated Development Plan, Emalahleni Local Municipality
- DFFE 2006, Guidelines for the development of the Integrated Waste Management Plan (IWMP) Pretoria, Department of Forestry and Fisheries and Environment
- CSIR, Industry Waste Management Plan, DFE

ANNEXURE OR REFERENCES (OPTIONAL)