LEPHALALE MUNICIPALITY



INTEGRATED WASTE MANAGEMENT PLAN REPORT ON RECYCLING Version V2.

27 December 2010

Compiled by



Background

As in any town around South Africa, waste recycling in Lephalale is an activity that the private sector has been driving for a while and volumes are as always driven by the demand of the product and the price at the time. The National Waste Management Strategy Implementation also noted that there are drivers to this which are mainly:

- Economic and
- Environmental; this always is last to be considered and comes in whenever there are desperate measures like the depletion of airspace at landfills

Waste recycling and reuse

"Recycling of waste refers to the separation at source of recyclable materials from the general waste stream and the reuse of these materials. The objectives of recycling are to save resources as well as reduce the environmental impact of waste by reducing the amount of waste disposed at landfills. To meet these objectives, waste separation at source is proposed, as the quality of recyclable materials is higher when separated at source. In addition, recycling has the potential for job creation and is a viable alternative to informal salvaging at landfills, which is undesirable due to the problems of health and safety associated with salvaging" (National Waste Management Strategy, 1999)

Recycling and Waste minimisation

Waste minimisation

Councils have an obligation under the waste management framework to promote waste minimisation strategies, which are outlined in detail in their Waste Management Plans. The focus is firmly on diverting as much waste from landfill as possible. There is emphasis on promoting greater individual and business responsibility for waste at all stages of its lifecycle. There are a number of ways in which waste reduction and recycling can be encouraged. Some examples are:

- User pays refuse collection
- Provision of smaller refuse receptacles
- By laws that ban recyclable material, including green waste, being placed in landfill.
- Easily accessible drop off centers
- Education and community based social marketing programmes that promote recycling which in this instance Lephalale has advanced in creating Eco-Clubs

Increased recycling is important for successful waste minimisation. For recycling to succeed, Socio-economic factors such as economic growth, population growth and

the value, size of recyclables and distance of recycling markets must be considered in a waste minimisation strategy.

Criteria for Lephalale adopting waste minimisation strategies should be influenced by the Polokwane resolution which advocates:" Zero waste to Landfill by 2022"

The declaration also emphasises the need to reduce generation and disposal by 50% and 25% respectively by 2012.

Going forward in developing the waste minimisation strategy for Lephalale, it is key to have accurate data on the current generation and recovery so as to enable the municipality to make proper assessment on whether it can meet the targets set in Polokwane on the 28th September 2001. (see Polokwane declaration)

Small and Rural Communities

Small and rural communities find recycling difficult to carryout successfully due to a range of logistical problems and a lack of skills and initiatives. Recyclers and businesses participating in these communities tend to not be sustainable, which results in stockpiles of unused recyclables that impact negatively on the aesthetics of their area of operation. The cost of transporting recyclables to the major centres is often exorbitant in so much that transportation costs exceed the value of the material transported and making it commercially unviable. Alternative uses of recyclables need to be investigated. Full cost accounting (and not only financial gain or job creation) needs to be considered, as well as municipal assistance/incentives to make practices sustainable. This matter has been discussed with the Waste division of Lephalale to look into the transportation cost for the recyclables (especially glass lying in Marapong).

It is equally important to bring politicians and councillors on board who have the authority to initiate waste management projects and who can approve the allocation of resources to such projects. It will also be seen if at the recommendation point of the IWMP if possible and practical, a dedicated waste minimization official should be part of the plan going forward to promote recycling, although smaller municipalities often cannot afford a dedicated official but with the growth of Lephalale, it may be an appointment worth their while.

One of the major observations made in this study as well as various smaller municipalities was the degree of recycling which varies significantly from 1 to 13% of the waste disposed of to landfills. This is because Lephalale like many other small authorities have it difficult in identifying or quantifying the waste being disposed of at their landfill sites since they do not have the necessary equipment (weigh bridges) or trained staff. This becomes the backbone of the Waste Information System which makes it important to understand the waste streams that need prioritisation in terms of recycling and minimisation

Waste Minimisation programs

- SOURCE REDUCTION
- CLEANER PRODUCTION
- WASTE EXCHANGE
- COMPOSTING
- RECLAIMING AT LANDFILLS
- DROP-OFF AND BUYBACK CENTERS
- MRF.'s etc



The picture above shows the importance of waste diversion from the landfill which saves the airspace

RECYCLING INITIATIVES IN LEPAHALALE



The above map shows all the location of recycling initiatives which are listed in the table below.

PROJECT NAME	AREA OF OPERATION	STATUS AND INFRASTRUCTURE
Phela Recycling	MARAPONG	Newly established and focus is on glass.
		No infrastructure but land allocated by municipality.
Kgabo Recycling Marapong Newly esta		Newly established private recycling business which has only been doing glass recycling
		Not a fully incorporated entity.
		Uses municipal land to stockpile collected material.
Lehumo recycling	Area around town and at the landfill	Well established small recycler with better infrastructure.
		Family run business, (Husband and wife)
		Operating from the landfill and collecting sorting recyclables from Medupi power station
Daphney Recycling	Marapong	Newly established and the area of focus is glass and cans. This is a one lady operation but has her own private land. Challenge she has is transportation
Bakgekolo-Bakgekolo	Marapong	An initiative that is part of an old age center.
		Focus has so far been on glass recovery and making crafts from waste material.
Malebana General Construction	Marapong	This is a well incorporated business that has just started recycling and has its own private land.
	Private land	There seem to be a potential in it since the operator has business acumen and adheres to all business regulatory requirements
Marapong Youth Recycling	Marapong	This is also and newly established youth initiative with s focus on glass, cans, paper and cardboard.
		The land they use has been allocated by council and so far have no infrastructure of their own.
Good Glass Recycling	All around the town and at shopping centers and commercial areas. Collecting some material from Medupi village	Good Glass has been in business for a while concentrating on scrap metal and has so far expanded into other waste products like paper and glass. They have embarked on pilot initiative with the municipality for the collection of waste separated at source. This is a two bag system and is currently running in one section town residential area.
Salvage and Recycling	All around town and commercial areas	They have been in business for a while collecting scrap metal and seem to be more established than all the recyclers in Lephalale. They have huge land adjacer to the bus depot.
		Own transportation collecting cardboard at commercial centers.

Waste Recycling Projects Assessed

A few of the projects were looked at and assessed to determine the extent to which they have taken recycling and also looking at the challenges they face of a daily basis in their operations. The sites visited were:

- 1. Salvage and Recycling
- 2. Good Glass Recycling

1. Salvage and Recycling

In developing this status quo Report, a visit was taken to determine the level at which recyclers are operating and the processes followed. One such visit was at Salvage and Recycling operated by a local entrepreneur. The operation has been on for the past two years initially concentrating on scrap metal and steel. This facility is located close to the bus depot and recovers a lot of corrugated boxes from the commercial centres. There are cages at these centres dedicated to the storing the boxes and get collected when the cages are full.

I. Infrastructure



The facility seems to have the relevant infrastructure to carry out any function related to waste sorting and bailing.

II. Legal and Safety findings

In terms of permits and regulatory issues, the operator seems to be unaware of the needs to be permitted and operates without a waste permit. This has never been raised with him before and assumes his operation adheres to the law. What is also of concern is the safety and environmental standards in the facility. The PPE (Personal Protective Equipment) which refers to protective clothing, helmets, goggles, or other garment designed to protect the wearer's body from injury is not adequate and the p

III. Products



- a. Scrap Metal
- b. Cardboard boxes (K4): Volumes are around 30 tonnes per month.
- c. PET(Coke Bottles)
- d. Plastic: four tons per month.
- e. Glass

IV. Market

The markets as in any remote town always seem to be the main challenge with the cost of transportation taking up most of the cost.

2. Good Glass Recycling

This is a fairly new entrant in the recycling business but seem to be making headway in separation at source. They have embarked on a pilot project together with the municipality in collecting blue bags of recyclables from a number of households in town. Other partners in the pilot are several schools in Marapong.



I. Infrastructure

The facility has enough equipment and a bailer. They also have trailer used for household waste collection, assumed to be used in the two bag system. The operator has a truck which he uses to transport the collected material to the market.

II. Legal and Safety findings



When asking the operator about the permit status, he also seemed surprised to hear that he needed a waste permit to operate a recycling facility.

Safety and lack of proper protective gear is also a concern at this facility especially working with equipment such as bailers and crushing glass. This will have to be addressed with all the recyclers. The photo above shows one of the employees pressing waste with his legs literally in the feeder of the bailing machine.

III. Products

- a. Scrap Metal
- b. Cardboard boxes(K4):
- c. PET(Coke Bottles)
- d. Plastic
- e. Glass

IV. Market

Like the other recyclers in the area, reaching the markets is a challenge due to the distance to Gauteng.

3. Marapong Community Recyclers

These group of recyclers are also new in the recycling business. Some of them have not even started trading with the materials they have collected. They need a lot of development and the municipality is making all efforts to give them the capacity they need and introduce them to the markets. Unfortunately there is not enough capacity within the municipality to deal with the challenges they have.

I. Infrastructure

The Marapong recyclers have no facilities that could be considered proper recycling areas. Almost all of them have nothing but the material they have recovered. The facilities that the recyclers have are basically open space plots where they have stockpiled the glass recovered.

II. Legal and Safety findings



- Currently the municipality is trying to get the recyclers organised and all protective gear is supplied by the municipality through the Glass Recycling Company of South Africa.
- Safety and lack of proper protective gear is a concern at these facility especially working with crushing glass
- Material is not covered and could be safety risk in the community.
- Most of the enterprises are not register businesses except for two.

III. Products

- a. Glass ; this is the major product and some actually handle glass only.
- b. PET
- c. Cans

IV. Market

Like the other recyclers in the area, reaching the markets is a challenge due to the distance to Gauteng. A transport contractor has been appointed by Consol to collect all the recovered glass but there is a complaint from the collectors about his turnaround time and the amount he pays them for the glass collected.

Obstacles to Recycling In Lephalale and Gaps identified

It was recommended at different forums that municipalities need to take waste minimisation seriously or else they will face a continuous problem of having no airspace for future disposal. Lack of infrastructure and political will is always sighted as the major reason for such inefficiencies. Some of the issues that affect municipalities like Lephalale are:

Limited or lack of markets:

Problems are being experienced with markets for recyclables particularly glass, newspapers and magazines, paper and cardboard. The Waterberg area and Lephalale is disadvantaged by the inaccessibility of recycling companies, i.e. most of the major recyclers are located in the Gauteng area which results in high transportation cost.

Prices for recyclables

Have also fluctuated significantly and as a result many recycling ventures have it difficult to survive under such conditions. For example, in one instance a recycler in Marapong mentioned that they were paid about a quarter of what is being paid in the Gauteng area. This was verified with one of the recyclers in Gauteng.

Limited Capacity at Local Authorities

Separation at source will require different waste collection trucks and the local authorities do not have the resources to purchase such trucks. Most local authorities do not have the necessary infrastructure to recycle waste at their landfill sites. As a result it is always better to outsource this function to the private sector and local communities.

Coordination of recycling initiatives

Better co-ordination is required between government (national, provincial, local authority), business and community initiatives in waste management and recycling. In this instance, Lephalale's waste division has made tremendous strides in the coordination of this function. It should always be noted that recycling much as it has financial benefits to the recyclers, it is equally beneficial to the municipality as it saves its airspace and also reduces its transportation loads especially if this can be done at source as it is piloted in the Onverwacht area.

High transportation costs:

The high costs associated with the transportation of recyclables from the rural areas to the major city centres, where the recycling companies are situated, are prohibitive. Lephalale is one of those remote towns and the processing of recyclables is far out mostly in Gauteng. This results in recyclers ending up with lots of stockpiles of recyclables hoping to get a better price but not realising that in some cases, the cost of transporting the material may be far higher than the pay-load.

Contamination:

Problems are experienced with the recycling of plastics because of contamination of the materials collected by the recyclers from contaminated waste streams on landfill sites. There is a need for separating out those types of plastics from source. When contaminated, the recyclers sometimes get discouraged and leave the material because the processors reject such material. With the separation at source/two bag pilot, there is hope that this problem can be resolved.

Access to funding:

A lot of people consider recycling a very easy business with limited barriers to entry but at the same time to fund for the expansion and better beneficiation of the recyclables, one would need funding. In the case of the recyclers in Lephalale and looking at the growth of the population, there will be a need when developing a recycling strategy to look at waste streams that can be beneficiated before sending to Gauteng. Such material may include plastic which can be pelletized. Banks consider recycling projects as high risk ventures and are as a rule hesitant to provided loans for these ventures. Support to these ventures by government, e.g. by way of a subsidy, may give greater security to these ventures and improved access to other funding. Lepahale may look at bringing in the likes of Eskom and Exxaro to partner in the waste reduction programs.

Lack of Skills:

There is a lack of skills and capacity at the local municipality level in the area of waste management and specifically waste minimisation, recycling and re-use. Environmental health departments can possibly assist with appropriate training by utilising their health

inspectors to assist with the process of waste management. Public/private partnerships with industry and the larger recycling companies should be explored. We could say the intervention of Eco –Clubs in Lephalale will actually help a lot in closing this gap however, the Eco-clubs will need to be capacitated as well.

Waste Stream Prioritisation

The Recycling component for the National Waste Management Strategy Implementation (NWMSI) project did make provision for the execution of Pilot Recycling projects that were intended to identify new waste stream to be recycled and exiting initiatives that could be expanded and improved. The idea is to target waste streams by the volumes they contribute to the total waste being disposed of at the landfills. In assessing the levels of recovery in Lephalale Glass and PET appear to be in the high volumes, although this has been difficult to quantify.

One could understand why such high volumes and this stems from the heat levels as people tend to consume more liquids to avoid dehydration.

The following waste streams were identified as having potential for recycling and therefore may be priority waste streams:

Glass: In this study/survey done recently, it shows that glass could be looked at as a waste stream that will need attention. This it could be understood because of the climatic conditions in the area. Lephalale is extremely hot and the consumption of liquid.

PET: Many of the community recyclers have collected PET and stockpiled it for recycling but are not yet ready to deal with it as it requires baling systems to make it viable. Like glass and beverage cans, PET is a very viable product in Lephalale but only if it is handled well. Currently Eskom is providing over 16 000 bottles of water and fruit juice daily to its workers at the Medupi construction site. These empty containers need to be properly sorted on site as some of them land on the Groothoek site contaminated with other waste.

Plastics: Plastics generally have a high value in the market but it seems that in Lephalale there is little activity in the recovery of plastics and this may be as result of a number of factors which could range from availability to lack of knowledge about the product. This product will be looked at in the final recycling strategy.

Garden waste: Generally this waste stream makes up a high percentage of the waste disposed to the landfill sites, however, in the case of Lephalale; it is lower than the national average of 25% but still significant to be dealt with in terms of beneficiating it to compost.

Building rubble present problems in terms of illegal dumping, since the implementations of the regulations prohibiting illegal dumping are difficult to enforce. It also makes up a high percentage of waste disposed to the landfill sites and could be treated and used more beneficially. There is a considerable market for builders'

rubble, but the generator and the users need to be linked. This could possibly also be linked the Department of Public Works' *Extended Public Works Programme*. City planning department could assist in terms of supplying information where building rubble could be used (e.g. a valuable source of base course material for roads); it was proposed that further research in this area should be encouraged. With the high level of housing development in Lephalale, this could be used as fillers for the foundations.

Composting of organic wastes:

Composting of organic and garden waste should be promoted. Garden waste constitutes as much as 10% of the waste going to landfill and that separation at source could lead to extensive recycling as compost. Some estimates indicate that the diversion of garden waste from landfill could significantly contribute to attaining the Polokwane goals. Smaller municipalities like Lephalale cannot afford equipment necessary for making compost from garden waste. To this end, Lephalale has engaged the services of a company that makes compost to chip all the garden waste that come to the landfill. This activity is done on an ad hoc basis and when entering the landfill, there is a stockpile of dry garden waste which can become a fire hazard if left unattended for long.

Tyres and rubber:

These are regarded as a major problem within mining towns and Lephalale is not an exception. The waste comes from used tyres and old conveyor belts. Discussions are underway between Government and the tyre industry and a draft memorandum of understanding has been developed. Government has also developed regulations regarding tyre waste management, have been released for public comment (DEA Website www.dea.gov.za). To initiate tyre recycling will require a major capital investment. Investigations are underway to use waste tyres as fuels in cement kilns. This already is already a problem waste stream within Lephalale and the mining area is generating a lot of this stream. There may be a great opportunity to look at a coordinated effort between the mines and the municipality in looking at how to deal with the tyres as a waste stream to be investigated for recycling.

Waste oil: Problems are being experienced with the satisfactory disposal of waste oil in the province, i.e. waste oil is currently dumped at landfill sites. A need for the regulation of the oil recycling industry. There are reputable companies, e.g. the ROSE Foundation, but there are also many companies active in this field that were providing sub-standard service.

Ash is a major contributor to the waste load on municipal landfills. Notwithstanding problems experience with the brick making ventures using ash, there is a potential to collect ash from formal settlements and to use it for brick making. This would address the problem of ash dumping as well as stimulating some job creation. Lephalale can have a coordinated project with Eskom to look into initiating a Waste Exchange Program that would take all the ash and supply brick makers in the area and this may just address the supply of bricks for the booming housing development in the area.



Waste Information System for Recycling

In the collection of data for the Lephalale IWMP, it was it was clear that a lot of data is not recorded by the recyclers. This big gap identified is the critical information needed on assessing waste minimisation levels, projects as well as information on quantities of waste recycled be it by formal recycling companies or informal ones in Marapong. Because the information is vital to determine the percentage of waste diverted from landfill, the need exists for a waste information system to capture the relevant information. The <u>Waste Information System</u> (<u>WIS</u>) is seen as a management tool and you cannot manage something you cannot measure. However, as was the finding, this information is not given willingly, and relevant legislation, perhaps within the revision of the by-laws will have to make provision for obtaining of relevant information. The need to develop a functional WIS which considers information related to waste minimisation is therefore a necessity. The ultimate design of this WIS should consider:

Quantity and type of materials being recycled Description of reclamation facilities Description of recycling facilities Collection methods used Number of formal and informal reclaimers who supply recyclables Prices for recyclables Waste minimisation initiatives failures and successes Assess the value and feasibility of poverty alleviation projects One of the tasks of the NWMSI Project was to develop a national Waste Information System (WIS) which integrates fully with provincial and local government WISs. It is of high importance that Lephalale looks at systems that can be utilised to gather more information that can be loaded into a WIS for the municipality.

The following specific inputs will be required by Lephalale to develop the WISs into sustainable databases:

- A good WIS is required to match buyers and sellers.
- A WIS would have to be well managed and kept updated to be useful.
- The need to quantitatively measure and monitor the achievement of recycling objectives and targets was stressed.
- The need for confidentiality of commercially sensitive information had to be properly addressed in terms of the information requested and placed on the WIS.
- Information on landfill sites should be included in the WISs.
- The WIS should provide access to support information for awareness and capacity building programmes.
- The WIS should provide information on what households can do with their waste.
- The WIS should provide current price trends of products.
- The WIS should act to disseminate information on recycling to Community Based Organisations (CBOs), the general public and other stakeholders. The Eco- Clubs of Lephalale could be part of the overall WIS development and updating its content.
- The mechanisms by which the WIS can be accessed by communities should be carefully considered.
- The WIS could perhaps be more efficient by targeting a few large generators rather than many small generators. This could include Eskom and Exxarro.
- The WIS could provide information on full cost accounting to guide consumers on which products to purchase.
- The WIS could provide Lephalale to showcase best practice.

GAP AND NEEDS ASSESSMENT

A number of issues and gaps were identified during the status quo analysis. Specific needs for the recycling sector raised based on these issues and gaps, which would need to be addressed as part of the strategy. These needs can be grouped into various sections which will be dealt with in the strategy.

The needs and actions could be grouped as follows and with actions

Gaps and Needs	Actions
Regulatory instruments and Institutional	Formalising recycling into a legal entity
arrangements	e.g. Cooperatives
Infrastructure	Developing buyback centers of a MRF.
Financial Tools	Funding Mechanisms for Recycling.
Waste Information System	Collection of data for all recycled
	material

OPTIONS AND MODELS

I. Drop Off Center

This is a facility set up to receive recyclable materials that are dropped off by individuals. Drop-off centers are usually not attended. The type of drop off facilities in Lephalale is the Azteca Plastic Omnium recycling banks that have been strategically positioned at certain areas like restaurants, bars and taverns.

II. Buy-Back Centres

These are facilities that purchases secondary materials, usually from the public, and resell them to brokers or manufacturers. Buy-back centers may or may not process the recyclables. There is currently not a single buy-back center in Lephalale and talks have been initiated with Buyisa-e-bag to look at how the model of developing buyback centers can be applied in Lephalale. This aspect will be well explored in the Waste Minimisation and Recycling strategy and the final plan. The strategy will explore the different kind of models that can be applied to overcome the current challenges that the small recyclers concentrated in Marapong experience.

It is also important to note that Metro's like Ethekwini through DSW has become recognised participation in community development projects and one of the major projects is the establishment of buy-back centres and community drop off centres. Thus far 23 Buy-back centres have been established within the eThekwini Region. The City of Jobug has also done the same in areas like Soweto. Landfill Consult was appointed in 2005 to offer training, equip and educate all personnel managing and operating the Zondi Buy Back Center in Soweto by implementing the following outputs set out in the report and the initial proposal. To this day the Zondi buyback center is one of the successful recycling center in Soweto. The model applied was

that of a community based company, which could have also taken a shape of a Cooperative. *(see Zondi Report)*

III. Waste Exchange

IV. Material Recovery Facility

A recycling operation that sorts materials by type then cleans and compresses the recyclables before shipping them to reprocessors. No doubt an integral part of Waste Management hierarchy going into the future. (Europe and America at it for over 20 years)



SEPARATION (as per schematic drawing)

- As incoming material moves along a **conveyer belt**, workers pull out large items, cardboard and plastic bags and toss them into bins. Unusable trash is thrown away.
- 2. The recyclables move into a double-deck **screening machine** that separates newspapers, mixed paper and containers into separate streams. Material bounces over rows of square wheels spinning 1,000 times per minute. Blasts of air dislodge cans and bottles from newspapers. Gaps between rollers allow smaller items to fall onto conveyer belts.
- 3. Workers again pull out any waste and discard it.
- 4. Next is the **trommel-mag** a large, rotating tube with small holes in the sides and an **electromagnet** at one end. Small items such as bottle caps fall through holes. The electromagnet snags tin cans. Then it's on to the **air classifier**, where a powerful fan blows lightweight aluminum and plastic onto one conveyer, and heavier glass falls onto another. Workers sort glass and plastics.

5. An **electromagnetic device** diverts aluminum cans into a storage bin

Mechanisms Identified That Would Encourage Recycling Include The Following:

- A central processing facility in each Waterberg to capacitate and assist municipalities unfamiliar with the processes of obtaining financial aid
- Government setting an example, for example by purchasing recycled paper as part of its procurement procedures.
- Current recycling initiatives are predominantly run by organized business; however workshop participants felt that involvement by Government could assist in addressing changing conditions in the recycling market and stabilising these markets. Government can also assist by creating new markets.
- Producers of commodities should be involved in buy back centres, e g through mechanisms such as extended producer responsibility (EPR).
- The problem of exorbitant transportation costs could be addressed by Government and business subsidising buy-back centres.
- The Municipal Infrastructure Grant (MIG) fund makes money available to local governments for infrastructure development.