# BERGRIVIER MUNICIPALITY

## INTEGRATED WASTE MANAGEMENT PLAN
**(4th Generation)**

**COMPILED BY:**

JPCE

**(Specialist Consulting Engineers)**

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# REPORT: BERGRIVIER MUNICIPALITY – INTEGRATED WASTE MANAGEMENT PLAN

JPCE Project Number: A165

**COMPILED FOR:**

BERGRIVIER MUNICIPALITY
P O BOX 60
PIKETBERG
7430

**COMPILED BY:**

**R. Pienaar Pr. Eng.**
Engineer
e-mail: reon@jpce.co.za

**REVIEWED BY:**

**JG Palm Pr. Eng.**
Director
e-mail: janpalm@jpce.co.za

**JPCE (PTY) LTD**
P O Box 931
Brackenfell
7561

e-mail: info@jpce.co.za
Tel: +27 (0) 21 982 6570
Fax: +27 (0) 21 981 0868

**COPIES ISSUED TO:**

| DEPARTMENT/COMPANY | ATTENTION (Name) | COPY NO. | DATE ISSUED | AUTHORISED BY |
|---|---|---|---|---|
| BERGRIVIER MUNICIPALITY<br>P O BOX 60<br>PIKETBERG<br>7430 | Mr Jaco Breunissen | 1 | 01/2019 | JG PALM |
| JPCE (PTY) LTD<br>P O Box 931<br>BRACKENFELL<br>7561 | Project File | 2 | 01/2019 | JG PALM |

# BERGRIVIER MUNICIPALITY

## INTEGRATED WASTE MANAGEMENT PLAN
## (4th Generation)

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## ANNEXURES

# ABBREVIATIONS

| | |
|---|---|
| CBD | Central Business District |
| DEADP | the Department: Environmental Affairs and Development Planning |
| HCGW | Health Care General Waste |
| HCRW | Health Care Risk Waste |
| HDPE | High Density Polyethylene |
| IDP | Integrated Development Plan |
| IPWIS | Integrated Pollutant and Waste Information System |
| IWMP | Integrated Waste Management Plan |
| IWMSA | Institute of Waste Management of South Africa |
| KPI | Key Performance Indicator |
| LDPE | Low Density Polyethylene |
| LM | Local Municipality |
| MEC | Member of the Executive Council |
| MRF | Material Recovery Facility |
| NDP | National Development Plan |
| NWMS | National Waste Management Strategy |
| NU | Non-urban |
| PET | Polyethylene terephthalate |
| PVC | Polyvinyl Chloride |
| SAWIS | South African Waste Information System |
| SDF | Spatial Development Framework |
| SP | Sub-place |
| WCDM | West Coast District Municipality |
| WCIWMP | Western Cape Integrated Waste Management Plan |
| WCPSDF | Western Cape Provincial Spatial Development Framework |
| WMO | Waste Management Officer |
| WWTW | Waste Water Treatment Works |

# BERGRIVIER MUNICIPALITY

## INTEGRATED WASTE MANAGEMENT PLAN

## FOURTH GENERATION

## EXECUTIVE SUMMARY

### INTRODUCTION AND GENERAL DESCRIPTION

JPCE (Pty) Ltd has been appointed by the Bergrivier Municipality in the West Coast District of the Western Cape Province to assist in developing their fourth generation Integrated Waste Management Plan (IWMP). The third generation Bergrivier IWMP was developed in 2014. This fourth generation IWMP will be developed during 2018 and will replace the third generation IWMP after obtaining Council approval.

The development of the IWMP is necessary as it is an integral tool to identify current needs and act as a guide towards sustainable waste management. With regular updates of this document the changing needs as well as progress in the waste management field can be tracked and strategies adapted accordingly. It also provides a framework for budgeting purposes. The IWMP must be incorporated as part of each Municipality's Integrated Development Plan (IDP), but is submitted as a separate document. The IWMP also shows alignment of its goals with the Western Cape IWMP, the district Municipality IWMP and the National Waste Management Strategy (NWMS).

The primary objective of integrated waste management (IWM) planning is to integrate and optimise waste management, in order to maximise efficiency and minimise the associated environmental impacts and financial costs, and to improve the quality of life of all residents within the Bergrivier Municipality.

The Plan takes particular note of importance of local authority waste management planning. This document underlines the following principles of the National Waste Management Strategy:

- The prevention of waste generation;
- The recovery of waste of which the generation cannot be prevented, and
- The safe disposal of waste that cannot be recovered

The general topography, geology and hydrogeology of the area is discussed in section 1.6 and the demographic details in section 3.2. The current population estimate of the Bergrivier Municipality is 68 373 people, based on the Census 2011 population and growth rates of the 2014 PWC study.

### POLICY AND LEGISLATION

All applicable waste management legislation is listed and discussed under section 3 of the IWMP. The latest published legislation have been added in the IWMP update, which mainly consists of Norms & Standards published under the Waste Act since the 2014 IWMP.

### WASTE QUANTITIES AND TYPES

The Bergrivier Municipality do not make use of internal landfill sites for disposal anymore. The waste generated within the municipality gets collected and sent to either the Velddrif or Piketberg transfer stations from where it is taken to Vredenburg (from Velddrif) and Malmesbury (from Piketberg) Landfills.

A full waste characterisation study of the black bag and clear bag waste was undertaken by Aquila Environmental during July and August of 2018 with 771 black bags and 623 clear bags sampled in the process. The waste was divided into a number of categories and recorded by weight. The results of the study is described under heading 3.3.3 and indicates that the combined municipal waste consists mainly of recyclables like glass, plastic etc. (>50%) and food waste (23%). The study also showed that the clear bag waste still contained some non-recyclables and that the black bag waste still contained some recyclable material.

The total waste for the Municipality for 2018 was estimated at 10 289 tonnes with a future estimated total of 10 437 tonnes for 2019. This equates to an average waste generation factor of 0.68 kg/person/day.

In the order of 3 100 tonnes of garden waste and 6 000 tonnes of builders rubble gets disposed of at the landfills and transfer station per year. The garden waste gets chipped and stored on site. Builder's rubble is disposed of on site at the closed landfills and at the Velddrif transfer station. The volume of builder's rubble at the Velddrif transfer station is creating a challenge since the waste is not removed from site and the facility is not licensed as a landfill. This waste stream can be used as cover material at the landfills and the municipality needs to implement a strategy to remove the builder's rubble and garden waste from the Velddrif transfer station site. This could be achieved by appointing a SMME contractor to chip and crush the waste and beneficiating it.

A survey was also undertaken on the hazardous waste generated within the Bergrivier Municipality. This survey was conducted by Aquila Environmental and provides information on the sources and types of hazardous waste within the Municipality. The principles of the NEMWA (Waste Act) was followed and a full description of the survey is given in Section 3.3.5 of the report.

**EXISTING WASTE MANAGEMENT STRUCTURE, SYSTEMS AND PRACTICES**

Solid waste management for the Bergrivier municipality falls under the Civil Engineering Services department of which Mr J Breunissen is the manager. Mr Breunissen is also the appointed Waste Management Officer for the municipality. A need exists for the waste management functions of the manager Civil Engineering Services to be delegated to a newly appointed position. The current Civil Engineering Services Manager has many responsibilities of which waste management is only one. With government and province rightly emphasising the importance of sustainable municipal waste management, the municipal responsibility for this function needs to be handled by a dedicated person, and thus a need exists to appoint a competent person for this function. The organisational structure is fully described in section 3.4 and there are currently 26 new positions (funded and unfunded) and 8 vacant positions for waste management within the municipality.

Bergrivier is divided into collection areas that have a fixed day per week when waste is collected. All formal residential households receive door-to-door waste collection services and in terms of free basic services there are 1753 registered indigent households in the Bergrivier Municipal area who qualify for free basic services according to the 2016/2017 annual report. The Municipality reports 100% service to these households and this number is down from 2208 as reported in the previous IWMP in 2013/14.

The Municipality operates two main recycling facilities in Piketberg and Velddrif. These facilities mainly focus on the recycling of Plastic, Cardboard (and paper), Metals and Glass. The Velddrif RTS recycles on average about 24 tonnes per month and the Piketberg RTS recycles in the order of 26 tonnes per month total.

The municipality has a system for the separate collection of garden waste from households and businesses through use of a green bag. Green bag waste is taken to either the old Piketberg landfill or the Velddrif transfer station where it is chipped and stored. Currently the chipped waste largely remains on site and plans need to be put in place for the chipped waste to be removed.

The Bergrivier Municipality is active in raising awareness and providing education on sustainable waste management within their jurisdiction. The Municipality distributes pamphlets pertaining to solid waste management information to its residents and these pamphlets also provide information on how the separate collection and recycling systems work. Information on waste collection and treatment is also available on the municipality's website.

**GAPS AND NEEDS ASSESSMENT**

The main gaps and needs identified for waste management within the Bergrivier Municipality are discussed in Chapter 4. They are:

- Legislation – Updating of by-laws and adherence to hazardous waste and landfill closure legislation;
- Waste generation quantities – Accurate recording of waste data and tonnages;
- Collection needs – Maintain collection services to all households and optimize routes;
- Waste transfer and disposal needs – Maintain drop-offs and prioritise closure of landfills;
- Waste minimisation recycling and reuse initiatives – Continue to improve on recycling and waste avoidance, with a focus on organic waste and builder's rubble;
- Institutional and organisational needs – fill all vacant positions and appoint dedicated waste management personnel;

- Identification of alternatives – Continue to look for ways in which to reduce waste to landfill by beneficiation the waste in innovative ways, with a focus on organic waste and builder's rubble.
- Funding mechanisms – Improvements require funding and new funding mechanisms need to be explored continuously;
- Public awareness and education – improve on successful public awareness and education campaigns and develop new ones.

**IMPLEMENTATION STRATEGY< MONITORING AND REVIEW**

Based on the gaps and needs identified, aligned goals of the IWMP and planned projects by the municipality, an implementation strategy was developed that contains the objectives, timeline and required resources for implementation of the IMWP. These gaps and needs are linked to the main goals contained in the Western Cape Provincial IWMP.

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 implementation of the fourth generation IWMP will start following Council approval. Apart from the continuous project implementation and goal tracking, which must be done by each individual project team as and when each project is running and report to Mr Breunissen or the designated Waste Management Officer, an annual IWMP report must be submitted along with the other Municipal annual reports and a copy sent to DEADP as well.

# BERGRIVIER MUNICIPALITY

## INTEGRATED WASTE MANAGEMENT PLAN

## FOURTH GENERATION

## 1. INTRODUCTION

### 1.1 TERMS OF REFERENCE

JPCE (Pty) Ltd has been appointed by the Bergrivier Municipality in the West Coast District of the Western Cape Province to assist in developing their fourth generation Integrated Waste Management Plan (IWMP). The third generation Bergrivier IWMP was developed in 2014. This fourth generation IWMP will be developed during 2018 and will replace the third generation IWMP after obtaining Council approval.

The terms of reference for this development are to source the required information, interpret the relevant data and plan accordingly in order to complete the IWMP in terms of the requirements as set out in the National Environment Management: Waste Act (Act no. 59 of 2008) and the contents listed below as required by the Western Cape Department of Environmental Affairs and Development Planning (DEADP).

Chapter 3, Section 11 (4) of the Waste Act states that each Municipality must submit its IWMP to the Member of the Executive Council of a province (MEC) for approval and include the approved IWMP in its Integrated Development Plan (IDP) contemplated in Chapter 5 of the Municipal Systems Act.

Chapter 3, Section 12 of the Waste Act further states that the contents of an IWMP must be at least the following:

(a) A situation analysis that includes
   i. A description of the population and development profiles of the area to which the plan relates;
   ii. An assessment of the quantities and types of waste that are generated in the area;
   iii. A description of the services that are provided, or that are available, for the collection, minimisation, reuse, recycling and recovery, treatment and disposal of waste; and
   iv. The number of persons in the area who are not receiving waste collection services;

(b) Within the domain of the Department, provincial department or municipality, set out how that Department, provincial department or municipality intends –
   i. To give effect, in respect of waste management, to Chapter 3 of the National Environmental Management Act;
   ii. To give effect to the objects of this Act;
   iii. To identify and address the negative impact of poor waste management practices on health and the environment;
   iv. To provide for the implementation of waste minimisation, reuse, recycling and recovery targets and initiatives;
   v. In the case of a municipal IWMP, to address the delivery of waste management services to residential premises;
   vi. To implement the Republic's obligations in respect of any relevant international agreements;
   vii. To give effect to best environmental practice in respect of waste management;

(c) Within the domain of the Department or provincial department, set out how the Department or provincial department intends to identify the measures that are required and that are to be implemented to support municipalities to give effect to the objects of this Act;

(d) Set out the priorities and objectives of the Department, provincial department or municipality in respect of waste management;

(e) Establish targets for the collection, minimisation, re-use and recycling of waste;

(f) Set out the approach of the Department, provincial department or municipality to the planning of any new facilities for disposal and decommissioning of existing waste disposal facilities;

(g) Indicate the financial resources that are required to give effect to the plan;

(h) Describe how the Department, provincial department or municipality intends to give effect to its IWMP; and

(i) Comply with the requirements prescribed by the Minister.

The IWMP content requirements further detailed by the DEADP IWMP guideline table of contents are as follows. Only the main headings are shown here. This IWMP was developed to contain all the required information, but does not follow the layout of the guideline exactly:

- Introduction and background information to the IWMP
- Status Quo:
  - Legislation
  - Demographic profile
  - Waste management cost and financing
  - Services and delivery
  - Compliance and enforcement
  - Waste generation and composition
  - Waste avoidance, reduction and recycling
  - Operational structure and staff capacity
  - Waste awareness and education
  - Waste information management
- Gaps and needs analysis
- Objectives and targets
- IWMP implementation
- Monitoring and review

The third generation Bergrivier 2014 IWMP by JPCE (Pty) Ltd was favourably reviewed by DEADP in 2015 and received an approval rating of 97.7%. The DEADP conclusions and recommendations were:

- The Municipality needs to verify the hazardous waste data obtained from the survey via IPWIS;
- The Municipality needs to provide clarity with respect to the management of waste from rural areas and whether a waste contractor is used to collect waste in rural villages;
- The Bergrivier draft IWMP report addresses most of the requirements of NEMWA.

This IWMP revision aims to address the requirements listed in the DEADP evaluation report as well.

## 1.2 BACKGROUND

The IWMP is a statutory requirement of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) that has been promulgated and came into effect on 1 July 2009 and has as its goal the transformation of the current methodology of waste management, i.e. mostly collection and disposal, to a sustainable practice focussing on waste avoidance and environmental sustainability. Implementation of this IWMP will be through municipal by-laws and in accordance with an implementation schedule.

The development of the IWMP is necessary as it is an integral tool to identify current needs and act as a guide towards sustainable waste management. With regular updates of this document the changing needs as well as progress in the waste management field can be tracked and strategies adapted accordingly. It also provides a framework for budgeting purposes. The IWMP must be incorporated as part of each Municipality's Integrated Development Plan (IDP), but is submitted as a separate document. The IWMP also shows alignment of its goals with the Western Cape IWMP, the District Municipality IWMP and the National Waste Management Strategy (NWMS). This 4$^{th}$ generation IWMP improved upon the previous generation document in that progress has been made with shortcomings identified in the previous plan.

There is increasing pressure on government, the public and industry to be more environmentally responsible especially in terms of solid waste generation and management. Making waste disposal priority can be seen as archaic planning and is not sustainable as disposal airspace is becoming limited and the establishment of new disposal facilities are becoming increasingly difficult due to the unavailability of suitable land. Establishing new disposal facilities are also increasingly expensive due to the design and construction requirements in order to safely dispose the waste to land. Although the eradication of the practice of waste disposal is currently not possible, the IWMP aims to identify ways on how to decrease disposal and move towards being an environmentally responsible society.

## 1.3 SCOPE OF THE IWMP

The scope of this local municipal IWMP includes an investigation into the current state of the solid waste management system of the Bergrivier Local Municipality and provides the overview thereof. This investigation aims to include all the various aspects of the solid waste management system which ranges from legislation, waste types and generation, waste facilities and infrastructure to financing and all other details as listed under the terms of reference above.

The status quo is evaluated in order to determine the gaps and needs of the system. The scope also includes goals and objectives to improve the system where required, but is limited to implementation on the local authority level. The implementation items in order to improve the waste management system and to achieve goals are coupled with a monitoring and review programme to ensure that the IWMP is up to date and is implemented.

The waste types measured and discussed are the following:

- Domestic waste
- Garden waste
- Building waste
- Household hazardous waste
- Hazardous waste (including health care risk waste)

The sources of the above waste types are also discussed and include the following:

- Residential areas
- Businesses
- Industry
- Farms
- Waste as a result of illegal dumping
- Street cleansing waste

## 1.4 METHODOLOGY AND APPROACH TO THE IWMP

The planning phase of the fourth generation IWMP included the following:

JPCE undertakes a number of IWMP documents for municipalities within the Western Cape, and during recent meetings with DEADP at their offices in Cape Town, the latest DEADP checklist requirements were discussed. Since DEADP have not updated its requirements since that time, an inception meeting was not required for this IWMP.

Aquila Environmental (Pty) Ltd was appointed as sub-consultant to JPCE in order to conduct the hazardous waste survey in the Bergrivier Municipal Area. All the generators of these waste types were identified and interviewed in order to obtain the quantities generated and the treatment and/or disposal methods as follows:

- The first step was a physical survey of the industrial areas within the Bergrivier Municipal footprint.

- All the industries were listed and contact details recorded, if available on the outside of the premises.

- Further detail was acquired from the telephone directory if so required. The directory was also used as a cross reference for certain industries, such as the general practitioners and dentists.

- During the physical survey some industries were directly visited.

- The balance of information were harnessed by
  a. Telephone calls and emails to contacts in major industries/hazardous waste generators as well as disposal and treatment facilities.
  b. Discussions during on-site meetings with the generator.

Aquila Environmental were also responsible for overseeing and recording the relevant data for the general waste characterisation study (WCS) with the assistance from the municipality. The methodology and results are described in **Section 3.3.3** of this IWMP report. Mr J Breunissen, Manager: Civil Engineering Services of the Bergrivier Municipality, provided additional information and references required to inform the IWMP. Mr Breunissen and his team also coordinated and provided some of the workers for the (WCS) as well as provided the premises.

SRK Consulting (Pty) Ltd was appointed to conduct the geological and geohydrological study for the Bergrivier Municipal area and generate the accompanying maps.

All the acquired information was reworked into the format presented in this report in order to reflect the status quo, draw conclusions and to make recommendations.

Public input is part of the development process and consulting the Municipal Integrated Development Plan (IDP) for needs relating to solid waste management as highlighted by the public in ward committee meetings were included.

The IWMP is submitted to the DEADP for evaluation and approval. The IWMP is only finalised after the Bergrivier Municipal Council approves it.

## 1.5 OVERALL AIMS AND GOALS OF THE IWMP

The primary objective of integrated waste management (IWM) planning is to integrate and optimise waste management, in order to maximise efficiency and minimise the associated environmental impacts and financial costs and to improve the quality of life of all residents within the Bergrivier Municipality.

The Plan takes particular note of importance of local authority waste management planning. This document underlines the following principles of the National Waste Management Strategy:

- The prevention of waste generation;
- The recovery of waste of which the generation cannot prevented, and
- The safe disposal of waste that cannot be recovered.

The Plan will address all areas of waste management – from waste prevention and minimisation (Waste avoidance), to its collection, storage, transport, treatment, recovery and final disposal. It will not only address the practicalities of waste management in context of this Municipality, but also the issues of public education and changing concepts, as these are vital to a successful management system.

The main goals of the Bergrivier IWMP are aligned with the goals of the Western Cape IWMP, the NWMS, the municipal Spatial Development Framework (SDF) and the municipal Integrated Development Plan (IDP). These are shown in the **Table 1.1** below. These main goals are shown in further detail and sub-goals and implementation items in **Section 5: Implementation and Strategy Plan** of the report.

The alignment of the Western Cape IWMP, National Waste Management Strategy 2011 and the National Development Plan 2030 are as follows:

**Table 1.1: Goals and Strategic Linkages**

| Western Cape IWMP (2017-2022) | | NWMS 2011 | | NDP 2030 | |
|---|---|---|---|---|---|
| **Goal 1:** | **Strengthened education, capacity and advocacy towards Integrated Waste Management** | Goal 4: | Ensure that people are aware of the impact of waste on their health, well-being and the environment | Chapter 9: | Improving education, training and innovation |
| Strategic Objective 1: | Facilitate consumer and industry responsibility in integrated waste management | | | | |
| Strategic Objective 2: | Promote and ensure awareness and education of integrated waste management | | | | |
| Strategic Objective 3: | Build and strengthen waste management capacity | | | | |
| **Goal 2:** | **Improved integrated waste management planning and implementation for efficient waste services and infrastructure** | Goal 5: | Achieve integrated waste management planning | Chapter 3: | Develop proposals for an acceptable minimum standard of living and proposals on how to achieve this over time. |
| Strategic Objective 1: | Facilitate municipal waste management planning | Goal 2: | Ensure the effective and efficient delivery of waste services | | |
| Strategic Objective 2: | Promote industry waste management planning | Goal 1: | Promote waste minimisation, re-use, recycling and recovery of waste | | |
| Strategic Objective 3: | Promote the establishment of integrated waste management infrastructure and services | Goal 3: | Grow the contribution of the waste sector to the green economy | | |
| Strategic Objective 4: | Ensure effective and efficient waste information management | Goal 6 | Ensure sound budgeting and financial management for waste services | | |
| | | Goal 7: | Provide measures to remediate contaminated land. | | |

| Western Cape IWMP (2017-2022) | | NWMS 2011 | | NDP 2030 | |
|---|---|---|---|---|---|
| **Goal 3:** | **Effective and efficient utilisation of resources** | Goal 2: | Ensure the effective and efficient delivery of waste services | Chapter 5: | Environmental Sustainability and Resilience: Absolute reductions in the total volume of waste disposed to landfill each year. |
| Strategic Objective 1: | Minimise the consumption of natural resources | Goal 1: | Promote waste minimisation, re-use, recycling and recovery of waste | Chapter 5: | Environmental Sustainability and Resilience: Put in place a regulatory framework for land use to ensure the conservation and restoration of protected areas. |
| Strategic Objective 2: | Stimulate job creation within the waste economy | Goal 3: | Grow the contribution of the waste sector to the green economy | Chapter 3: | Economy and Employment |
| Strategic Objective 3: | Increase waste diversion through reuse, recovery and recycling | | | | |
| **Goal 4:** | **Improved compliance with environmental regulatory framework** | Goal 5: | Achieve integrated waste management planning | Chapter 5: | Environmental Sustainability and Resilience: Put in place a regulatory framework for land use to ensure the conservation and restoration of protected areas. |
| Strategic Objective 1: | Strengthen compliance monitoring and enforcement | Goal 1: | Promote waste minimisation, re-use, recycling and recovery of waste | | |
| Strategic Objective 2: | Remediate and rehabilitate contaminated land | Goal 8: | Establish effective compliance with and enforcement of the Waste Act. | | |
| Strategic Objective 3: | Facilitate the development of waste policy instruments | Goal 2: | Ensure the effective and efficient delivery of waste services | | |
| Strategic Objective 4: | Promote self/co-regulatory measures | | | | |

The Bergrivier Municipality IWMP links with these national and provincial documents in that it will adopt the goals and strategic objectives of the Western Cape Provincial Integrated Waste Management Plan.

The alignment of the Bergrivier IWMP, IDP and SDF are as follows:

| Bergrivier 4th Generation IWMP (2018) | | Bergrivier IDP (2017 – 2022) | | Bergrivier SDF (2012 – 2017) | |
|---|---|---|---|---|---|
| **Goal 1:** | **Strengthened education, capacity and advocacy towards Integrated Waste Management** | **Goal 3:** | **Facilitate an enabling environment for economic growth to alleviate poverty** | Strategic Objective 6: | **Create high quality living environments across the municipality;** |
| Strategic Objective 1: | Facilitate consumer and industry responsibility in integrated waste management | Strategic Objective 2: | To create an efficient, effective, economic and accountable administration | Strategic Objective 8: | The public good should prevail over the private good in the process of planning for the upgrading of, or for the creation of new land use rights; |
| Strategic Objective 2: | Promote and ensure awareness and education of integrated waste management | Strategic Objective 7: | To improve the regulatory environment for ease of doing business | Strategic Objective 5: | Readdress spatial and social imbalances; |
| Strategic Objective 3: | Build and strengthen waste management capacity | Strategic Objective 5: | To develop and provide bulk infra-structure | Strategic Objective 3: | Maximise public access to the municipality's resources, opportunities and amenities; |
| **Goal 2:** | **Improved integrated waste management planning and implementation for efficient waste services and infrastructure** | **Goal 5:** | **A sustainable, inclusive and integrated living environment** | **Strategic Objective 7:** | **Ensure horizontal and vertical alignment with both provincial plans and policies as well as neighbouring municipalities;** |
| Strategic Objective 1: | Facilitate municipal waste management planning | Strategic Objective 14: | To develop, manage and regulate the built environment | Strategic Objective 11: | Fair and good governance, requiring that spatial planning, land use management, and land development must be democratic, legitimate and participatory. |
| Strategic Objective 2: | Promote industry waste management planning | Strategic Objective 8: | To facilitate an environment for the creation of jobs | | |

| Bergrivier 4th Generation IWMP (2018) | | Bergrivier IDP (2017 – 2022) | | Bergrivier SDF (2012 – 2017) | |
|---|---|---|---|---|---|
| Strategic Objective 3: | Promote the establishment of integrated waste management infrastructure and services | Strategic Objective 5: | To develop and provide bulk infra-structure | Strategic Objective 1: | Work harmoniously with nature, reduce the municipality's ecological footprint and change unsustainable patterns of resource use (all development or land use changes should be sustainable, including management and use of resources in the natural and built environment, and in particular management and use that may lead to threats of degraded biodiversity, pollution and amalgamating into a greater threat of climate change adaptation); |
| Strategic Objective 4: | Ensure effective and efficient waste information management | | | | |
| **Goal 3:** | **Effective and efficient utilisation of resources** | **Goal 2:** | **Sustainable service delivery** | Strategic Objective 3: | Maximise public access to the municipality's resources, opportunities and amenities; |
| Strategic Objective 1: | Minimise the consumption of natural resources | Strategic Objective 12: | To promote a safe environment for all who live in Bergrivier | | |
| Strategic Objective 2: | Stimulate job creation within the waste economy | Strategic Objective 10: | To alleviate poverty | | |
| Strategic Objective 3: | Increase waste diversion through reuse, recovery and recycling | Strategic Objective 8: | To facilitate an environment for the creation of jobs | | |
| **Goal 4:** | **Improved compliance with environmental regulatory framework** | Strategic Objective 15: | To conserve and manage the natural environment and mitigate the impacts of climate change | Strategic Objective 8: | The public good should prevail over the private good in the process of planning for the upgrading of, or for the creation of new land use rights; |
| Strategic Objective 1: | Strengthen compliance monitoring and enforcement | Strategic Objective 14: | To develop, manage and regulate the built environment | | |
| Strategic Objective 2: | Remediate and rehabilitate contaminated land | Strategic Objective 12: | To promote a safe environment for all who live in Bergrivier | | |
| Strategic Objective 3: | Facilitate the development of waste policy instruments | Strategic Objective 7: | To improve the regulatory environment for ease of doing business | | |
| Strategic Objective 4: | Promote self/co-regulatory measures | Strategic Objective 2: | To create an efficient, effective, economic and accountable administration | Strategic Objective 5: | Readdress spatial and social imbalances; |

## 1.6 GEOGRAPHIC AREA OF STUDY

Bergrivier Local Municipality (LM) (also referred to as Bergrivier) is the northern neighbour of both Swartland and Saldanha Bay Municipalities with the Berg River forming the southern boundary of the Bergrivier LM. It is an area noted for its wheat farms in the central and eastern portion and its fishing industries in the western area.
The Bergrivier LM area hosts many industries, but the agriculture and fishing related industries appear to be the main economic drivers. Due to the colourful history of this area and the picturesque views, tourism is a fast growing industry in Bergrivier.

**Figure 1.1** shows the extent of the municipal area, major towns, roads and surface water features. The Bergrivier LM was established in December 2000 through the amalgamation of the former municipalities and towns of Piketberg, Porterville, Velddrif, Redelinghuys and Aurora.

### 1.6.1 Topography and climate

The municipal area is relatively flat, except for the area around Piketberg and the eastern edge of the municipality that consists of a mountain range (Olifantsrivierberg / Groot Winterhoek). The southern area slopes towards the Berg River while the northern area drains towards the Olifants River. The western area slopes towards the Atlantic Ocean.

The area has a Mediterranean type climate and is known for its hot summer days. Average annual rainfall is approximately 400 mm, with the southern portion receiving more than the northern portion. The evaporation is high, approximately 1600 mm per annum, which is four times the rainfall.

The sections below discusses the geology and geohydrology of the Bergrivier LM area.

### 1.6.2 Geology and Hydrogeology

#### 1.6.2.1 Geology

Figure 1.2 is a simplified geological map adapted from the 1:500 000 scale hydrogeological maps for Cape Town 3318 and Clanwilliam 3218 Cape Town (Department of Water and Sanitation).

The municipality comprises an area of approximately 4 407 km$^2$ and is underlain by rocks of two geological formations, which are covered by superficial sandy deposits in the coastal plain area. From oldest to youngest these formations are the Malmesbury Group, Table Mountain Group and Quaternary deposits. These are discussed briefly below.

The Malmesbury Group comprises very old rocks, >600 million years old, which have been compacted and deformed over this long time period into mostly impermeable rocks. This Group comprises two subgroups in the study area, the Swartland and Boland Subgroups/terranes. These comprise mostly phyllitic and schistose rocks with limestone lenses and sandstone horizons. The rocks have been eroded into a low-lying, rolling topography. In terms of surface outcrop area, this Group occupies 42.4% of the study area.

Resistant quartzitic sandstones of the Table Mountain Group (TMG) form the Piketberg and the mountains to the east, the Olifantsrivierberg. These rocks occupy 22.4% of the study area. The Group comprises a number of formations of which the most important are;

- The basal Piekenierskloof Formation, comprising a conglomerate and sandstone, which is up to 390 m thick;
- The overlying Peninsula Formation, a thick sequence of resistant quartzites and quartzitic sandstones with a maximum thickness of 1 800 m;
- The Cedarberg Shale Formation, a marker horizon approximately 120 m thick; and
- The Nardouw Subgroup comprising two sandstone formations in the study area and only present in the southern part of the study area.

The Quaternary deposits comprise sandy and loamy soils in the more inland areas changing to wind-blown sand and calcrete overlying coarser sand and gravel deposits of marine and fluviatile origin in the coastal areas. They reach their thickest development of approximately 70 m on the Farm Melkplaas. They occupy 35.2% of the study area.

There are a number of faults and fold structures in the area. The main fault is the De Hoek Fault which runs in a NW-SE direction along the western boundary of the Piketberg. There are also numerous parallel trending faults in the Piketberg and ENE-WSW trending faults on its eastern side. There is a synclinal fold structure running through the southern part of the Piketberg, and the Eendekuil Valley represents a broad anticlinal structure.

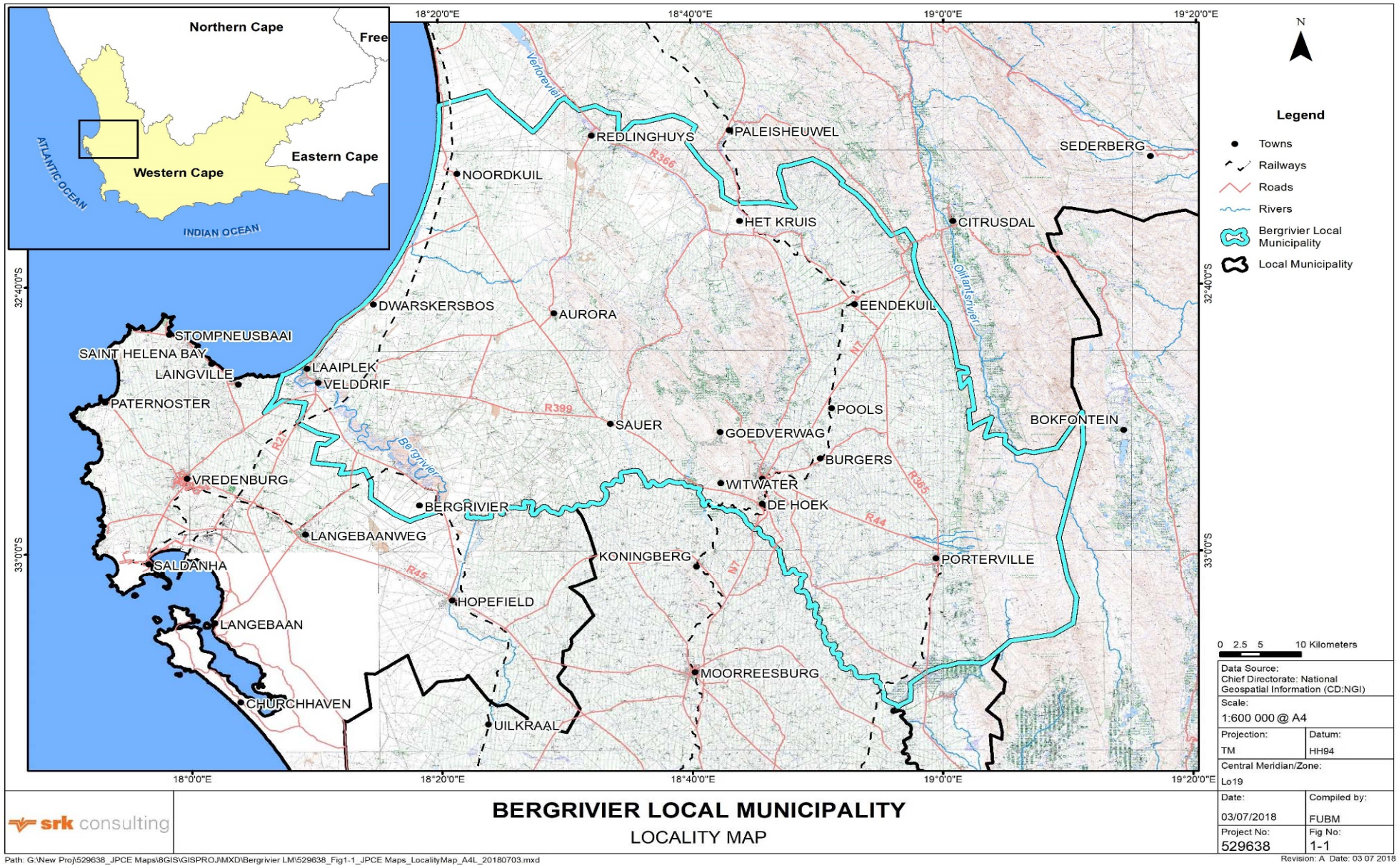



**Figure 1.1: Study Area –Municipal Area**

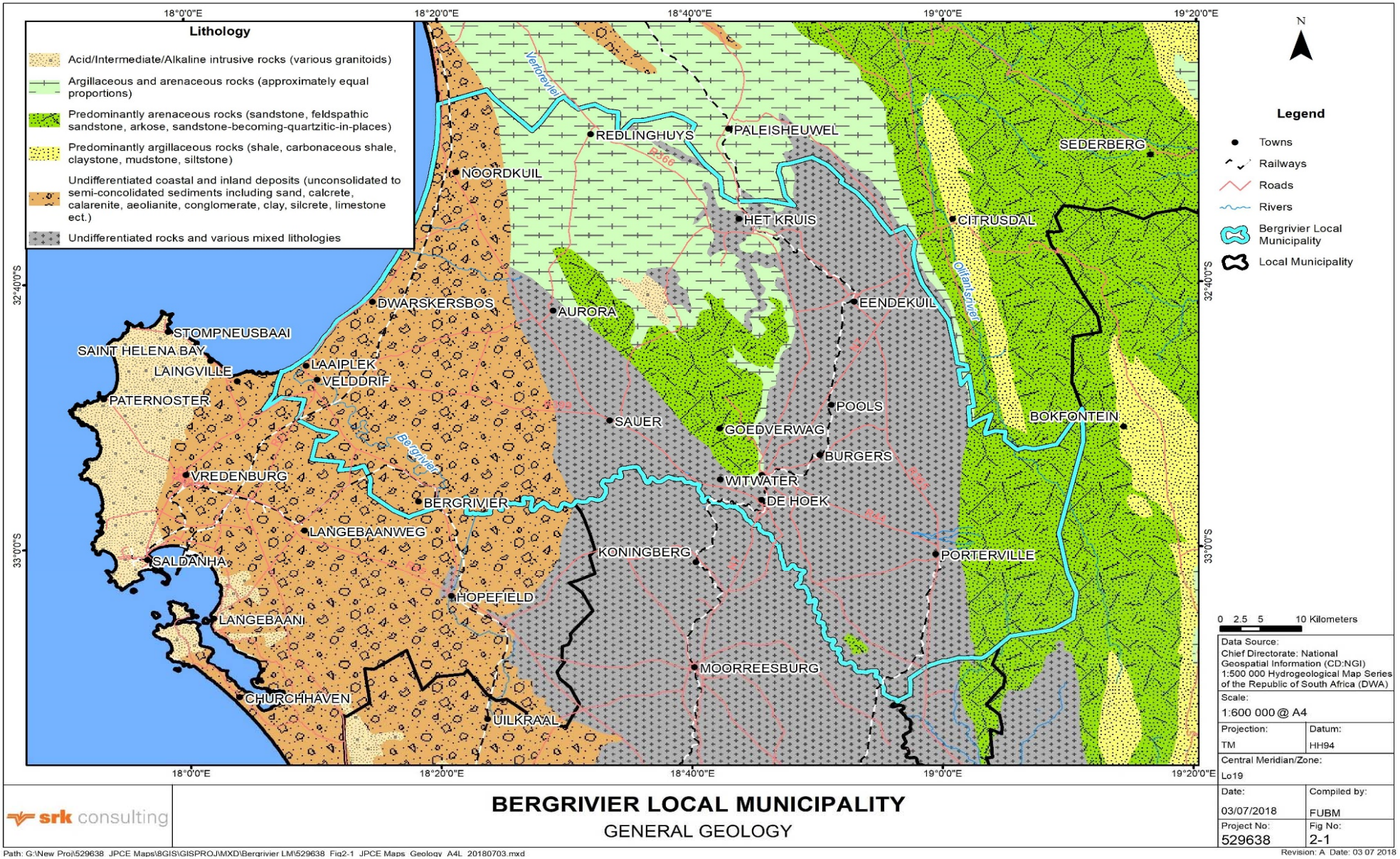



**Figure 1.2: Geology of the Municipal Area**

#### 1.6.2.2 Groundwater and Hydrology

**Figure 1.3** and **Figure 1.4** are adapted from the Cape Town hydrogeological map referred to above. In broad terms, any aquifers developed in the rocks of the Malmesbury and Table Mountain Groups are of the fractured or secondary type (green coloured areas **Figure 1.3**. Aquifers developed in the Quaternary unconsolidated sediments are of the intergranular or primary type (violet coloured areas on **Figure 1.3**).

Groundwater potential and quality in the Malmesbury Group is very variable. Close to the contact with the TMG Aquifer, in fault zones, sandstone horizons and where they are overlain by saturated Quaternary sediments, yields can be relatively high and groundwater quality moderate to good. However, away from such zones and in the lower rainfall areas of the central-northern areas, yields and quality are poor, generally <1 ℓ/s and >2000 mg/ℓ Total Dissolved Solids (TDS), respectively. This aquifer is important for widespread but generally small-scale groundwater use, e.g. stock watering and local domestic purposes.

The TMG aquifer has good groundwater potential but is often inaccessible for direct drilling. Targets are available in the De Hoek Fault zone, parts of the Piketberg, where faults connect the TMG to lower-lying accessible areas in the Malmesbury rocks and to the north-west of the Piketberg, where the rocks are covered by Quaternary deposits. There is fairly widespread borehole development in the accessible parts of the Piketberg and median borehole yields are in the range 2 to 5 l/s. Municipal groundwater use by Piketberg (town) is approximately 540 000 $m^3$/a, of which approximately 158 000 is spring water. Groundwater flow and occurrence are generally deep seated in the TMG Aquifer and the average depth of boreholes is >100 m. Some free-flowing artesian boreholes occur. Groundwater quality is generally good with TDS <150 mg/l.

Reasonable aquifer development is found in the Quaternary sand and gravel deposits of the coastal area in the so-called Adamboerskraal Aquifer. Borehole yields of >5 l/s are achievable in the thicker parts of this aquifer but yields of 0.1 to 0.5 l/s are more common. Groundwater quality is generally poor and within the range 150 to 1 300 mS/m, which limits the exploitation potential of this aquifer. Fairly large-scale groundwater abstraction (~100 000 $m^3$/a) occurs on the farms Februarieskraal and Palieskraal for the irrigation of potatoes. Water levels are relatively shallow in this aquifer at <10 m below ground level.

The Berg River forms the southern boundary of the Bergrivier municipal area and the southern area drains towards this river. The north-eastern area drains towards the Olifants River that flows in a northerly direction. Both these rivers are classified as sensitive rivers with regard to water quality, which poses a restriction on land-uses in their catchment areas.

The presence of these two water bodies results in virtually the whole of Bergrivier being located in a sensitive catchment area and as such increases the importance of proper waste management within Bergrivier.

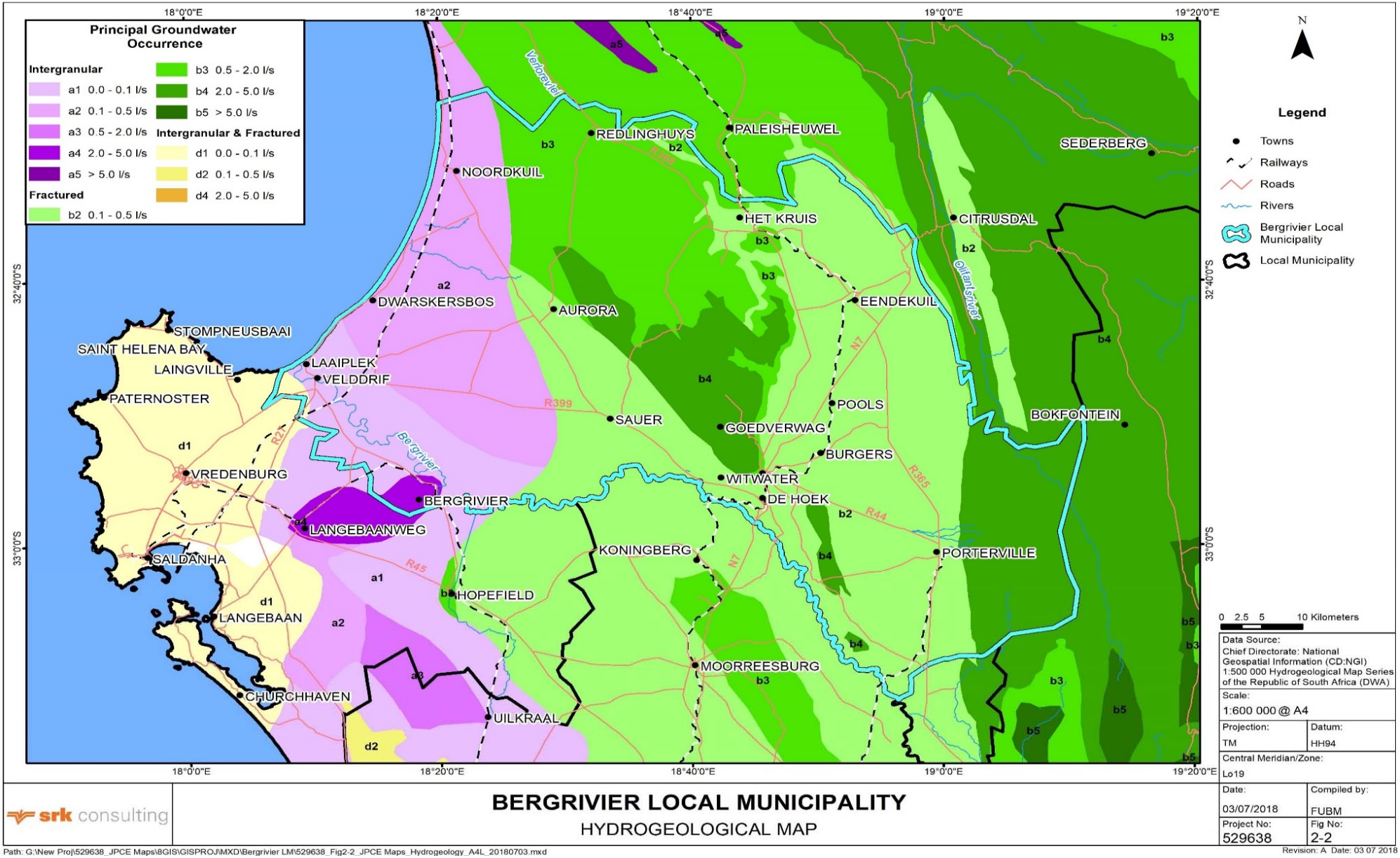



**Figure 1.3: Hydrogeology of the Municipal Area**

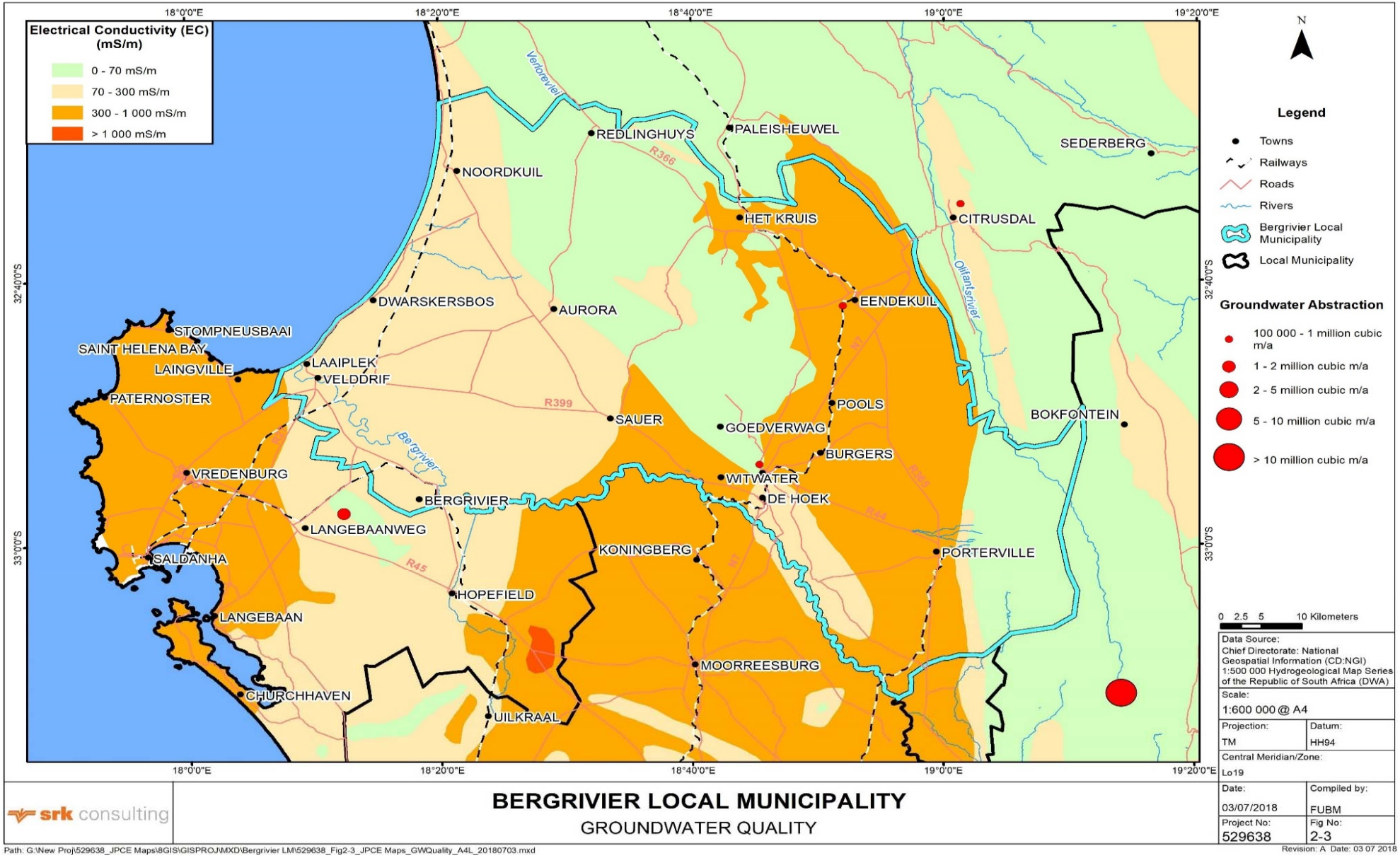



**Figure 1.4: Groundwater Quality the Municipal Area**

## 1.7 DISTRICT MUNICIPALITY

The Bergrivier Municipality is located in the West Coast District Municipality (WCDM) in the Western Cape Province. This District is comprised of the Bergrivier, Cederberg, Bergrivier, Saldanha Bay and Swartland local municipalities.

The role of the District Municipality does not affect the solid waste functions of the local Municipalities. Only when waste from more than one municipality is disposed of at a regional site, does it become a District function. The West Coast District does not have a District Solid Waste Forum at this stage. It is recommended that such a Forum is established as it allows for the municipalities in the District to work and plan together and achieve the solid waste goals and targets as a District. This is even more relevant now since it is the author's understanding that the District Municipality is in an advanced stage of developing a regional landfill site for some of the municipalities in the District. Further opportunities and solutions can also be further explored between Forums of different Districts.

The WCDM's purpose is stated on their website as follows:

***The purpose of the WCDM and the five affiliates (local municipalities), is to share the responsibility for the local government in their areas, and to ensure that all communities, particularly disadvantaged communities, have equal access to resources and services. WCDM assist local municipalities, who don't have the capacity in finances, facilities, staff or knowledge to provide them with services to enhance their communities.***

The WCDM's mission is as follows:

***Through participation and cooperation, the West Coast District Municipality is committed to developing the people in the district optimally.***

### 1.7.1 District Municipality IWMP

The WCDM adopted their 2nd generation IWMP document in 2012 and according to the 2017-2022 WCDM IDP they plan to update their IWMP as soon as all the local municipalities within the district has completed their next generation IWMP documents, since the District's waste management functions flow from the functions of the local municipalities. The 2012 WCDM IWMP states the following strategic objective of waste management within the district.

**To ensure that Waste Management in the West Coast District Municipal Area complies with South African and International environmental standards so that it is beneficial to industrial and agricultural growth and the public's right to a clean and healthy environment.**

The above strategic objective is to be implemented through adoption of the waste hierarchy and the effective management of waste to ensure minimal waste to landfill. The Bergrivier Municipality's IWMP will tie in to this overarching objective of the District Municipality.

## 1.8 LOCAL MUNICIPALITY

The Bergrivier Local Municipality has the following policies, vision and mission:

### 1.8.1 Vision and Mission

The Bergrivier 4th generation IDP (2017 – 2022) explains the vision, mission, strategic goals and strategic objectives of Bergrivier Municipality and it also sets out the development priorities. Bergrivier's strategy remains a high level strategy that links IDP strategic goals and strategic objectives to functional development priorities. Development priorities derive from community needs, institutional needs and the Municipal Frameworks and Sector Plans. Key Performance Indicators have been developed to measure the extent to which we have achieved our strategic objectives and game changers.

The vision and mission of Bergrivier Municipality have been redrafted given the new situational analysis and mandate of Council. They are as follows:

***VISION :***
***"Bergrivier: a prosperous community where all want to live, work, learn and play in a dignified manner."***

***MISSION :***
***"Commitment to sustainable development and the delivery of services that are responsive to the developmental needs of all communities in Bergrivier Municipality."***

### 1.8.2 Connection with other Local Municipalities

The Bergrivier local municipality has agreements with the Saldanha Bay and Swartland local municipalities on use of landfill airspace. All waste generated in the Bergrivier municipality is transported to the Velddrif or Piketberg transfer stations. Waste from Piketberg transfer station is then taken to the Highlands landfill in Malmesbury (Swartland Municipality) for final disposal and waste from the Velddrif transfer station is taken to the Vredenburg landfill in Saldanha Bay municipality for final disposal.

## 2. STAKEHOLDER PARTICIPATION

### 2.1 CONSULTATION WITH AUTHORITIES

The Assessment Report of the previous, 3rd Generation, IWMP formed the first consultation with authorities as it was issued by the DEADP. It served as the first identifier of the issues that needed to be addressed during the IWMP update process to the fourth generation plan.

JPCE (Pty) Ltd have had meetings with DEADP on the compilation of municipal IWMP documents and have been informed by DEADP of what their requirements for these plans are.

The DEADP will also review and evaluate the IWMP as per the previous generation report in order to indicate whether it conforms to the required standards.

### 2.2 CONSULTATION WITH THE PUBLIC AND OTHER INTERESTED AND AFFECTED PARTIES

The IDP developed in 2016/17 included an extensive pubic consultation process on topics including waste management. This was done in order to identify the needs as expressed by the communities in Bergrivier. This was predominantly done through regular ward committee meetings, with specific reference to the ward committee meetings in September of each financial year. The public participation process was further enhanced through public meetings in each town on a bi-annual basis following the ward committee meetings as to ensure that members of the public have equal and open access to providing inputs.

Experience with public participation processes shows that needs identified often are repeated on an annual basis as not all needs can be addressed due to budgetary constraints. To overcome a repetitive process, the municipality requested needs identified in the past be listed from previous IDP's and Annual Reports. These needs have been divided into needs already addressed and needs still to be addressed. As far as the inputs from public on the development of the IWMP goes, the majority of public comments are on the adequate collection and treatment of waste and this will be addressed in the goals and implementation plan of the IWMP.

The waste management related needs identified during the public participation process is given below. These are a combination of the waste related inputs from the 2017 and 2018 round if public consultation and reflects the public's needs relating to waste management within the municipality.

| Ward | Main Settlements | Needs Identified and Addressed | Needs Identified but not yet addressed | New Needs Identified |
|---|---|---|---|---|
| 1 | Porterville (East) | Recycling of waste | | Production of compost (EPWP) and increased recycling |
| 2 | Porterville (West) | Recycling of waste | | Refuse not being removed timeously; Job creation in form of recycling; Removal of refuse bags is slow - municipal workers take own time |
| 3 | Piketberg, De Hoek | Recycling of waste; Composting | | Big steel refuse containers; Identify areas for Recycling bins |
| 4 | Piketberg | Recycling of waste; Composting | | More bins in street |
| 5 | Redelinghuys, Eendekuil | | Control over "land fill site" Redelinghuys | Refuse bins at homes (Redelinghuys) |
| 6 | Dwarskersbos, Aurora | Recycling of waste; Landfill site in Velddrif rehabilitated | Awareness of recycling of waste; Control over "dumpsite" in Aurora; Fees for dumping too high | Aurora – monitoring and control at landfill; Aurora – old landfill sites need urgent attention |
| 7 | Velddrif | Recycling of waste; Rehabilitation of "land fill sites" | Recycling awareness projects | |

# 3. STATUS QUO

This section of the IWMP entails the situational analysis of the Bergrivier Municipality, which includes amongst others, the applicable legislation, population description, waste types and quantities generated and waste management services overview.

## 3.1 LEGISLATION

The applicable legislation is listed here and includes the Bergrivier municipal waste management by-laws. The legislation is discussed in no particular order, grouping similar laws together where applicable.

### 3.1.1 Constitution of the Republic of South Africa

In 1996 the new Constitution created the right to the environment as a fundamental right. This fundamental right to the environment ensures everyone's right to an environment that is not harmful to their health or well-being. South African law, the environment and all South Africans have a constitutional right to have the environment protected for present and future generations. This means that there must be reasonable legal and other measures to prevent ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

All legislation has to fall within the stipulations of the Constitution. The following sections are of particular relevance where waste is concerned:

- **Section 24(a)**

  Provides everyone the right to an environment that is not harmful to a person's health and well-being.

- **Section 24(b)**

  Provides everyone the right to have the environment protected through reasonable legislative and other measures. The implementation of section 21, 22 and 26 of the Environment Conservation Act, 1989 is such a legislative measure to protect the environment.

- **Section 25**

  Provides for property rights. The Constitution makes provision for both property rights and the right to a healthy environment. A situation may arise in extreme cases where there is a conflict due to rejecting an application for a listed activity from taking place. In such cases it will be up to the court to decide whether the interest of the community (right to a healthy environment) weights heavier than the right to the individual.

- **Section 32**

  Provides the right to access to information. The lack of information is one of the major obstacles in environmental impact management. Provision has been made in the regulations in terms of section 26 of the Environment Conservation Act, 1989, that any report submitted becomes a public document.

- **Section 38**

  Provides *locus standi* or the "right to get involved" to any member of the public. This means that any member of the public has the right to take appropriate action to prevent environmental damage. This may include taking action against the relevant authority for failing to perform its duties in preventing environmental damage or any individual or authority who is in the process of undertaking listed activities in terms of section 21 of the Environment Conservation Act, 1989, without the necessary authorisation to undertake such activities.

- **Section 41**

  Provides principles for co-operative governance and intergovernmental relations. The Constitution allocates legislative authority as well as executive and administrative powers to all three levels of government. Schedules 4 and 5 determine the functional areas of government. The environment is a cross-sectorial matter and it is therefore important that co-operation between government on all levels is necessary. Furthermore, Chapter 7 of the Constitution of South Africa (Act 108 of 1996) describes the role and responsibilities of Local Government, which include the objectives in Section 152:

  "The objects of local government are:

  - to promote social and economic development.
  - to promote a safe and healthy environment…".

  These principles are further developed in the National Environmental Management Act 1998 (Act 107 of 1998).

  The Constitution (Act No. 108 of 1996) is relevant to pollution and waste management for two reasons. Firstly, the Bill of Rights (Chapter Two of the Constitution) contains a number of rights relevant to integrated pollution and waste management, to the extent that an Act or particular statutory provision that does not uphold these rights, is unconstitutional. Secondly, the Constitution provides the legal basis for allocating powers to different spheres of government, and is thus relevant to the institutional regulation of integrated pollution and waste management.

**Sovereign**

The Constitution states that South Africa is a sovereign, democratic state. In terms of environmental management, it is important to recognize that sovereignty includes the ability to limit sovereign powers by entering into international agreements where the need arises.

**The Bill of Rights**

The most pertinent fundamental right in the context of integrated pollution and waste Management is the Environmental Right (Section 24), which provides that:

***"Everyone has the right***

***(a) to an environment that is not harmful to their health or well-being; and***
***(b) to have the environment protected, for the benefit of present and future generation through reasonable legislative and other measures that –***

***(i) prevent pollution and ecological degradation;***
***(ii) promote conservation; and***
***(iii) Secure ecologically sustainable development and the use of natural resources while promoting sustainable economic and social development."***

The section of the Bill of Rights specifically imposes a duty on the State to promulgate legislation and take other steps to ensure that the right is upheld and that, other things, pollution and ecological degradation are prevented.

### 3.1.2 National Environmental Management Act

The NEMA (Act 107 of 1998) provides for co-operative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith.

As the principal framework act for environmental issues, it has direct relevance to the implementation of the National Waste Management Strategy, one of the key implications being the designation of the DEAT as lead agent for the environment. Chapter 7 of NEMA has important direct implications for the achievement of the NWMS initiative.

The environment as defined in NEMA is the natural environment along with its physical chemical, aesthetic and cultural properties that influence human health and well-being.

NEMA contains the following environmental principles:

- Environmental management must put people and their needs at the forefront, and must serve their interest fairly.
- Development must be socially, environmentally and economically sustainable. This means that the following things must be considered before there is development:
  a) Disturbance of ecosystems and loss of biodiversity
  b) Pollution and degradation of the environment
  c) Disturbance of landscapes and sites where the nation's cultural heritage is found
  d) Non-renewable resources must be used responsibly
  e) The precautionary principle must be applied
  f) Negative impacts must be anticipated and prevented and if they can't be prevented they must be minimized or remedied.
- Environmental management must be integrated. The best practical environmental option must be pursued.
- Environmental justice must be pursued so that there is not unfair discrimination in the way that negative environmental impacts are distributed
- There should be equitable access to environmental resources, benefits and services to meet basic human needs. Special measures may be taken to ensure access for persons disadvantaged by unfair discrimination.
- Responsibility for environmental health and safety of any policy, programme or project must continue throughout the life cycle of a project
- Public participation in environmental decision-making must be promoted. The participation of vulnerable and disadvantaged groups must be ensured

- Decisions must take into account the interests, needs and values of all interested and affected parties. This includes recognizing all forms of knowledge including traditional and ordinary knowledge
- Community well-being and empowerment must be promoted through environmental education
- The social, economic and environmental impacts of the activities must be assessed
- The rights of workers to refuse to do work that is harmful to human health or the environment and to be informed of dangers must be respected
- Decisions must be taken in an open and transparent manner and access to information provided in accordance with the law
- There must be inter government co-ordination and harmonization of policies and laws
- Actual or potential conflicts of interest between organs of state must be resolved through conflict resolution procedures
- Global and international responsibilities relating to the environment must be discharged in the national interest
- The environment is held in a public trust for the people and the use of environmental resources must serve the public interest, and be protected as the people's common heritage
- The polluter must pay for the costs of remedying pollution, environmental degradation and adverse health impacts
- The vital role of youth and women in environmental management must be recognized and their full participation promoted
- Sensitive or stressed ecosystems must receive special attention in planning which might affect them especially when they are subject to significant resource usage and development pressure.

NEMA also stipulates in Section 24 that there must be an environmental impact assessment before any activity or development that needs permission by law and which may significantly affect the environment.

Section 28 places a specific duty of care on every person to prevent, or mitigate and remediate, environmental damage and pollution. Any person, who was responsible for, or directly or indirectly contributed to the pollution, can be held liable. This includes the owner of the land at the time the pollution occurred or their successor in title, a person in control of the land at that time, or any person who negligently failed to prevent the situation.

The public can use NEMA to exercise their rights when they believe that the right procedures were not followed. Therefore it is extremely important to make sure that when there is a proposed development where the municipality is involved e.g. change of land-use – to make sure that the consultant and/or developers follow the right procedures.

**The NEMA Environmental Impact Assessment Regulations**

Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities that may not commence without environmental authorisation or existing activities in respect of which an application for environmental authorisation is required. In this context, EIA Regulations contained in three General Notices in terms of NEMA (GN R385, 386 and 387) (came into force on 3 July 2006.)

The 2006 Regulations were repealed by the June 2010 EIA Regulations (GN R543), and the June 2010 EIA Regulations were repealed and replaced by the 2014 EIA Regulation (GNR 982, GNR 983, GNR 984 and GNR 985.) The purpose of the Regulations is to regulate the procedure and criteria as contemplated in Chapter 5 of the Act relating to the submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities in order to avoid detrimental impacts on the environment, or where it can con be avoided, ensure mitigation and management of impacts to acceptable levels, and to optimise positive environmental impacts, and for matters pertaining thereto.

### 3.1.3 National Environmental Management Act: Fees for consideration and processing of applications for environmental authorisations and amendments thereto (Government Notice 28 February 2014)

These regulations apply to the above applications excluding community based projects funded by government grants or applications made by organs of state. The commencement date is 1 April 2014. Payment details are discussed regarding the different applicable fees which are listed as follows:

| Application | Fee |
|---|---|
| Application for an environmental authorisation for which basic assessment is required in terms of the Environmental Impact Assessment Regulations | R2 000.00 |
| Application for an environmental authorisation, for which a S&EIR is required in terms of the Environmental Impact Assessment Regulations | R10 000.00 |
| Application dealt with in terms of section 24L of the Act | (a) 100% of the most expensive application, namely, R10 000 (Ten Thousand Rand) if S&EIR is triggered and R2000 (Two Thousand Rand) if the basic assessment is triggered; |
| | (b) 50% of the other application, namely, R5 000 (Five Thousand Rand) if the S&EIR is triggered or R1 000 (One Thousand Rand) if the basic assessment is triggered) |
| Amendment of an environmental authorisation on application by the holder of an environmental authorisation. | R2 000.00 |

### 3.1.4 Environment Conservation Act, 1989 (Act NO. 73 of 1989)

On 1 July 2009 the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) ("the Waste Act") came into effect. The Waste Act repealed Section 20 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) ("ECA") and introduces new provisions regarding the licensing of waste management activities.

The Waste Tyre Regulations (2009) which were published on 13 February 2009 came into effect on 30 June 2009, and makes provision for effective and integrated management of waste tyres in the country. It provides regulations for tyre producers, tyre dealers and waste tyre stockpile owners.

The regulations furthermore require the compilation of industry waste tyre management plans and waste tyre stockpile abatement plans and details the requirements for waste tyre storage areas.

### 3.1.5 The Western Cape Health Care Waste Management Amendment Act, 2007 (No 6 of 2010)

Act 7 of 2007 was amended in 2010 so as to align the terminology with that used in the National Environmental Management: Waste Act, 2008; to define or redefine certain expressions; to delete certain unnecessary definitions; to provide for the issuing of compliance notices; to amend the provisions relating to offences and penalties; to make further provision regarding regulations; to effect certain textual changes; and to provide for matters incidental thereto. The Health Care Management Bill provides for the effective handling, storage, collection, transportation, treatment and disposal of health care waste by all persons in the Province of the Western Cape; and provides for matters incidental thereto.

The object of this Act is to promote integrated health care waste management and thereby—

(a) reduce the risks of health care waste to human health;
(b) prevent the degradation of the environment;
(c) prevent the illegal dumping of health care waste;
(d) promote sustainable development, and
(e) Ensure responsible management of health care waste within the Province.

Under this Act a Municipality must:

(a) enforce the relevant provisions of this Act within its area of jurisdiction;
(b) perform audits of generators, transporters, treaters or disposers of health care waste within its area of jurisdiction to ensure compliance with the provisions of this Act;

(c) report annually to the Provincial Minister on the number of incidents of illegal dumping of health care risk waste within its area of jurisdiction, the number of incidents of illegal dumping of health care risk waste pursued in a court of law, and the number of incidents of illegal dumping of health care risk waste successfully convicted in a court of law.

Health Care Waste is produced by hospitals, clinics, physicians, offices, dentists, funeral homes, veterinary clinics and medical- and research laboratories.

Currently only 10-15% of medical waste is considered infectious. The enormous volumes of health care waste requiring special handling and disposal for all infectious and pathological waste are responsible for the current re-evaluation of the terminology for health care waste.

The modern trend in infection control is dictated by the risk posed by the procedure and not by the diagnoses. Thus health care waste is divided into Health Care General Waste (HCGW) and Health Care Risk Waste (HCRW). HCRW generally indicates infectious waste, pathological waste, sharps, chemical and pharmaceutical waste, radioactive and cytotoxic waste.

### 3.1.6 The Western Cape Health Care Waste Management Amendment Act, 2007: Western Cape Health Care Risk Waste Management Regulations, 2013

These regulations were published in the Western Cape: Provincial Gazette Extraordinary 15 March 2013. These are the regulations set out in the Schedule under section 14 of the Western Cape Health Care Waste Management Act, 2007.

The regulations address the requirements for packaging, storage, internal transport, external transport, vehicles, drivers, treatment and disposal of health care risk waste. Furthermore the required training, registration of health care risk waste generators, transporters, treaters and disposers, reporting, auditing and record keeping is discussed. Health care waste management plans must be prepared by those who meet the criteria listed. The required actions regarding compliance notices are also listed.

All addressed forms in the regulations are given in the Annexures:

Annexure A: Minimum Requirements for health care risk waste containers
Annexure B: Minimum Requirements for storage of health care risk waste in terms of regulation 3
Annexure C: Form 1, Minimum Requirements for a tracking document
Annexure 4: Minimum Requirements for information to be contained in a Health Care Waste Management Plan
Annexure 5: Form 2.1, IPWIS registration form for health care risk waste generators, transporters, treaters and disposers
Annexure 6: Form 2.2, Registration Certificate; Form 3.1, Monthly record keeping form for generators; Form 3.2 Monthly record keeping form for transporters, treaters and disposers
Annexure 7: Form 4.1, Compliance Notice; Form 4.2, Compliance certificate.

### 3.1.7 National Water Act (Act no. 36 of 1998)

The purpose of the Act is to ensure that the Municipality's water resources are protected, used, developed and conserved in ways which take into account the protection of aquatic and associated ecosystems; that addresses basic human needs; that ensures the reduction and prevention of pollution; and that meets international obligations.

Section 19 of the NWA deals with landowners and users involved in any activity or process which causes, has caused or is likely to cause pollution of water resources. Such landowners and users are obliged to take all reasonable measures to prevent any such pollution from occurring, continuing or recurring. This includes measures to comply with any prescribed waste standard or management practice.

Furthermore, the NWA requires anyone who intends undertaking a water use, as defined, to obtain a licence. The water uses that may be relevant to waste management activities are:

- discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit; and
- Disposing of waste in a manner which may detrimentally impact on a water resource.

The applications for permits, licences and exemptions made before the promulgation of this Act could still be dealt with in terms of the Water Act 1956 (Act No. 54 of 1956).

### 3.1.8 National Environment Management: Air Quality Act 2004 (Act no. 39 of 2004)

This Act has been promulgated in order to reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development. It also provides for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.

**The object of this Act is:**

a) to protect the environment by providing reasonable measures for-

   (i) The protection and enhancement of the quality of air in the Republic;
   (ii) The prevention of air pollution and ecological degradation; and
   (iii) Securing ecologically sustainable development while promoting justifiable economic and social development; and

b) Generally to give effect to section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people.

### 3.1.9 National Waste Management Strategy (2011)

The National Waste Management Strategy (2011) presents Government's strategy for integrated waste management for South Africa and is a legislative requirement of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) The purpose of the Strategy is to achieve the objectives of the Waste Act.

The National Waste Management Strategy presents a long-term plan (up to the year 2016) for addressing key issues, needs and problems experienced with waste management in South Africa. The strategy gives effect to the Bill of Rights, Constitution of South Africa, Act 107 of 1998, on the basis of which the people of South Africa have the right to an environment that is not detrimental to their health. Furthermore, the strategy translates into action Government's policy on waste as set out in the Draft White Paper on Integrated Pollution and Waste Management for South Africa (published in 1998).

The objective of integrated pollution and waste management is to move away from fragmented and uncoordinated waste management to integrated waste management. Such a holistic and integrated management approach extends over the entire waste cycle from cradle to grave, and covers the prevention, minimisation, generation, collection, transportation, treatment and final disposal of waste. Integrated waste management thus represents a paradigm shift in South Africa's approach to waste management, by moving away from waste management through impact management and remediation and establishing instead a waste management system which focuses on waste prevention and waste minimisation.

The Strategy is built around a framework of eight goals, as listed below, along with specific goals that needed to be reached by 2016, as described below.

Goal 1: Promote waste minimisation, reuse, recycling and recovery of waste.
- 25% of recyclable diverted from landfill sites for re-use, recycling or recovery.
- All Metropolitan Municipalities, secondary cities and large towns have initiated separation at source programmes.

Goal 2: Ensure the effective and efficient delivery of waste services.
- 95% of urban households and 75% of rural households have access to adequate levels of waste collection services.
- 80% of waste disposal sites have permits.

Goal 3: Grow the contribution of the waste sector to the green economy.
- 69 000 new jobs created in the waste sector.

Goal 4: Ensure that people are aware of the impact of waste on their health, well-being and the environment.
- 80% of municipalities running local awareness campaigns.
- 80% of schools implementing waste awareness programmes.

Goal 5: Achieve integrated waste management planning
- All Municipalities have integrated their IWMPs with their IDPs and have met the targets set in the IWMPs.
- All waste management facilities required to report to SAWIS have waste quantification systems that report information to WIS.

Goal 6: Ensure sound budgeting and financial management for waste services.
- All municipalities that provide waste services have conducted full-cost accounting for waste services and have implemented cost reflective tariffs.

Goal 7: Provide measures to remediate contaminated land.
- Assessment complete for 80% of sites reported to the contaminated land register.
- Remediation plans approved for 50% of confirmed contaminated sites.

Goal 8: Establish effective compliance with and enforcement of the Waste Act.
- 50% increase in the number of successful enforcement actions against non-compliant activities.
- 800 EMIs appointed in the three spheres of government to enforce the Waste Act.

The strategy aims to reduce both the generation and the environmental impact of waste. It presents a plan for ensuring that the socio-economic development of South Africa, the health of its people and the quality of its environmental resources are no longer adversely affected by uncontrolled and uncoordinated waste management. It establishes a waste management system that concentrates on avoiding, preventing and minimising waste and makes provision for waste management services for all by extending an acceptable standard of waste collection, as well as transportation, treatment and disposal services to all communities.
While the long-term objective of the strategy is waste prevention and minimisation, a number of remedial actions such as improved waste collection and waste treatment are required in the shorter term due to prevailing inadequate waste management practices.

The Strategy is an institutionally inclusive strategy because its achievement relies on participation by numerous role-players in the public sector, private sector and civil society.

To implement the Waste Act, government must:

- Draft legislation, regulations, standards and Integrated Waste Management Plans.
- Regulate waste management activities through licences and enforce their conditions.
- Implement the South African Waste Information System (SAWIS)
- Coordinate waste management activities using a system of Waste Management Officers.
- Give effect to multilateral agreements and ensure proper import and export controls.
- Progressively expand access to at least a basic level of waste services and plan for future needs.
- Facilitate the establishment of a national recycling infrastructure.
- Provide the framework for the remediation of contaminated land.
- Work in partnership with the private sector and civil society.

### 3.1.10 White Paper on Education and Training (1995)

The 1995 *White Paper on Education and Training* states that “environmental education, involving an interdisciplinary, integrated and active approach to learning, must be a vital element of **all levels and programmes of the education and training system**, in order to create environmentally literate and active citizens and ensure that all South Africans, present and future, enjoy a decent quality of life through the sustainable use of resources”.

The White Paper advocates environmental education and training **at all levels**. This would include the local government sphere, particularly when it comes to the environmental education & training of government officials and workers.

The education of the youth is the responsibility of national and provincial government. However, the Constitution does state that where the capacity exists, functions can be delegated to local government, and that the spheres of government, while distinctive, are interdependent and interrelated. Local government should support the other spheres of government (such as the national Department of Education, DoE) in areas of its own focus, such as environmental management and sustainable development.

### 3.1.11 The Municipal Systems Act (Act 32 of 2000)

This policy outlines the role and responsibilities of local governments as to:

- Provide democratic and **accountable** government for local communities;
- Ensure the provision of services to communities in a **sustainable** manner;
- Promote **social** and economic development;
- Promote a safe and healthy **environment**;
- Encourage the **involvement** of communities and community organisation in the matters of local government; and
- Strive, within its financial and administrative capacity, to achieve the objectives above.

These responsibilities indicate a need for an environmentally educated work force (accountable) as well as an environmentally educated public (involvement). The municipal Systems Act (32 of 2000) requires municipalities to promote public participation and to build the capacity of residents, councillors and municipal officials to engage in participatory processes. As a means of tracking progress in this area, the executive of a municipality is obliged to report annually on the level of public participation in municipal matter.

Each Municipality must include in its integrated development plan contemplated in Chapter 5 of the Municipal Systems Act, an integrated waste management plan that is consistent with the relevant provincial integrated waste management plan. The annual performance report which must be prepared in terms of section 46 of the Municipal Systems Act must contain information on the implementation of the municipal integrated waste management plan.

### 3.1.12 The Municipal Structures Act, 1998 (Act no. 117 of 1998)

This act makes provision for the establishment of municipalities in accordance with the requirements relating to categories and types of municipality. It establishes criteria for determining the category of municipality to be established in an area and defines the types of municipality that may be established within each category.

The Act furthermore provides for an appropriate division of functions and powers between categories of Municipality and regulates the internal systems, structures and office-bearers of the municipalities. It also provides for appropriate electoral systems for matters in connection therewith.

### 3.1.13 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008) ("The Waste Act")

On 1 July 2009 the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) ("the Waste Act") came into effect. The Waste Act repealed Section 20 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) ("ECA") and introduces new provisions regarding the licensing of waste management activities.

Provision has been made in the form of legislative and regulatory tools to facilitate and ensure implementation of the Act by all spheres of government.

The Waste Act was published to reform the law regulating waste management in order to protect the health of the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.

The purpose of this Act is to protect health, well-being and the environment by providing reasonable measures for –

- the minimisation of the consumption of natural resources;
- the avoidance and minimisation of the generation of waste;
- the recovery, re-use and recycling of waste;
- the treatment and safe disposal of waste as a last resort;
- the prevention of pollution and ecological degradation;
- securing ecologically sustainable development while promoting justifiable economic and social development;
- promoting and ensuring the effective delivery of waste services;
- remediating land where contamination presents, or may present, a significant risk of harm;
- achieving integrated waste management reporting and planning;
- to ensure that people are aware of the impacts of waste on health and the environment;
- to provide for compliance and generally to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to the health and well-being of people.

The interpretation and application of this Act must be guided by the national environmental management principles set out in section 2 of the National Environmental Management Act.

The Waste Act allows for the compilation of a Waste Management Strategy, national, provincial and local standards.

Municipalities must in terms of their by-laws:

- establish service standards and levels of service for the collection of waste;
- may identify requirements in respect of the separation, compacting and storage of waste;
- may identify requirements for the management of waste, including requirements in respect of the avoidance of the generation of waste and the recovery, reuse and recycling of waste;
- the requirements in respect of the directing of waste to specific treatment and disposal facilities.

Each Municipality must include in its integrated development plan contemplated in Chapter 5 of the Municipal Systems Act, an integrated waste management plan that is consistent with the relevant provincial integrated waste management plan.

The annual performance report which must be prepared in terms of section 46 of the Municipal Systems Act must contain information on the implementation of the municipal integrated waste management plan.

Municipalities must also in terms of the Act:

- conduct municipal activities in accordance with the National Waste Management Strategy and any national or provincial norms and standards;
- compile an integrated waste management plan;
- ensure that waste management services are provided within the municipality in a manner which prioritises the recovery, re-use or recycling of waste and provides for the treatment and safe disposal of waste as a last resort;
- designate a waste management officer;
- ensure that provision is made for the management and collection of litter;
- secure compliance with the objects of this Act that are in the domain of the municipality; and
- Implement any other measures that are necessary for securing the objects of this Act that are within the domain of the municipality.

**Duty to provide collection services -** Every municipality has an obligation to progressively ensure that efficient, effective and affordable waste collection services are provided in its area.

A municipality may, by notice, require any person making use of the municipal collection service to separate specified types of waste from the general waste for the purposes of recovery, re-use or recycling.

In terms of Section 19(1) of the Waste Act, the Minister may publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment. In terms of Section 20 of the Waste Act no person may commence, undertake or conduct a waste management activity except in accordance with the following:

- the requirements or standards determined in terms of Section 19(3) of the Waste Act for that activity; or
- a waste management licence issued in respect of that activity, if a license is required.

On 3 July 2009 a list of waste management activities were published. These activities were published in Government Notice 178 in Government Gazette No. 32368 of 3 July 2009. No person may commence with, undertake or conduct these activities unless a waste management licence is issued in respect of the activity.

A person who wishes to commence, undertake or conduct an activity listed under Category A must conduct a Basic Assessment process whilst activities listed under Category B requires a Scoping and EIA process to be undertaken.

In terms of Section 49(2) of the Waste Act a decision to grant a waste management licence in respect of a waste disposal facility is subject to the concurrence of the Minister responsible for Water Affairs. The Waste Act further specifies that the issuing of a waste management licence for a waste disposal facility is subject of the inclusion in the licence of any conditions contained in a Record of Decision issued by the Minister responsible for Water Affairs regarding any measures that the Minister responsible for Water Affairs considers necessary to protect a water resource as defined in the National Water Act, 1998 (Act No. 36 of 1998).

### 3.1.14 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): List of waste management activities that has, or is likely to have a detrimental effect on the environment. Government Notice 1094, 11 October 2017

The notice replaces the amended 2013 list of activities that trigger a waste licence requirement and because of its impact on financial budgets and budget scheduling, all the activities, quoted verbatim (except where grammatically corrected) from the notice, are listed below:

**"GENERAL**

No person may commence, undertake or conduct a waste management activity listed in this schedule unless a licence is issued in respect of that activity.

**CATEGORY A**

3. A person who wishes to commence, undertake or conduct an activity listed under this Category, must conduct a basic assessment process, as stipulated in the environmental impact assessment regulations made under section 24(5) of the National Environmental management Act, 1998 (Act No. 107 of 1998) as part of a waste management licence application.

**Storage of waste**

(1) The storage of general waste in lagoons.

**Recycling or recovery of waste**

(2) The recycling of general waste at a facility that has an operation area in excess of 500m$^2$, excluding recycling that takes place as an integral part of an internal manufacturing process within the same premises.

(3) The recycling of hazardous waste in excess of 500kg but less than 1 tonnene per day calculated as a monthly average, excluding recycling that takes place as an integral part of an internal manufacturing process within the same premises.

(4) The recovery of waste including the refining, utilisation, co-processing of the waste in excess of 10 tonnes but less than 100 tonnes of general waste per day or in excess of 500kg but less than 1 tonnene of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process with in the same premises.

**Treatment of waste**

(5) The treatment of general waste using any form of treatment at a facility that has the capacity to process in excess of 10 tonnes but less than 100 tonnes.
(6) The treatment of hazardous waste using any form of treatment at a facility that has the capacity to process in excess of 500kg but less than 1 tonnene per day excluding the treatment of effluent, wastewater or sewage.
(7) The remediation of contaminated land.

**Disposal of waste**

(8) The disposal of inert waste in excess of 25 tonnes and with a total capacity of 25 000 tonnes, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.
(9) The disposal of general waste to land covering an area of more than 50m$^2$ but less than 200m$^2$ and with a total capacity not exceeding 25 000 tonnes.
(10) The disposal of domestic waste generated on premises in areas not services by the municipal service where the waste disposed exceeds 500kg per month.

**Construction, expansion or decommissioning of facilities and associated structures and infrastructure**

(11) The construction of facilities for waste management schedule activity listed in Category A of this Schedule (not in isolation to associated activity)
(12) The expansion of waste management activity listed in Category A or B of this Schedule which does not trigger an addition waste management activity of this Schedule
(13) The decommissioning of facility for a waste management activity listed in Category A or B of this Schedule.

**CATEGORY B**

4. A person who wishes to commence, undertake or conduct a waste management activity listed under this Category, must conduct a scoping and environmental impact reporting process, set out in the Environmental Impact Assessment Regulations made under section 24(5) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as part of a waste management licence application contemplated in section 45 read with section 20(b) of this Act.

**Storage of hazardous waste**

(1) The storage of hazardous waste in lagoons excluding storage of effluent, wastewater or sewage.

**Reuse, recycling and recovery of waste**

(2) The reuse and recycling of hazardous waste in excess of 1 tonnene per day, excluding reuse or. Recycling that takes place as an integral part of an internal manufacturing process within the same premises.
(3) The recovery of waste including the refining, utilisation or co-processing of waste at a facility with a facility that processes in excess of 100 tonnes of general waste per day or in excess of 1 tonnene of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.

**Treatment of waste**

(4) The treatment of hazardous waste in excess of 1 tonnene per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage.
(5) The treatment of hazardous waste in lagoons, excluding the treatment of effluent, wastewater or sewage.
(6) The treatment of general waste in excess of 100 tonnes per day calculated as a monthly average, using any form of treatment.

**Disposal of waste on land**

(7) The disposal of any quantity of hazardous waste to land.
(8) The disposal of general waste to land covering an area in excess of 200m$^2$ and with a total capacity exceeding 25 000 tonnes.

(9) The disposal of inert waste to land in excess of 25 000 tonnes, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.

**Construction of facilities and associated structures and infrastructure**

(10) The construction of facilities for a waste management activity listed in Category B of this this Schedule (not in isolation to associated waste management activity).

**CATEGORY C**

5. A person who wishes to commence, under take or conduct a waste management activity listed under this Category, must comply with the relevant norms or standards determined by the Minister listed below-
   (a) Norms and Standards for Storage of Waste, 2013 or
   (b) Standards for Extraction, Flaring or recovery of Landfill Gas, 2013; or
   (c) Standards for Scrapping or Recovery of Motor Vehicles, 2013; or
   (d) National Norms and Standards for the Sorting, Shredding, Grinding, Crushing, Screening or Baling of General Waste, 2017.

**Storage of waste**

(1) The storage of general waste at a facility that has the capacity to store in excess of 100$m^3$ of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste.

(2) The storage of hazardous waste at a facility that has the capacity to store in excess of 80$m^3$ of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste.

(3) The storage of waste tyres in a storage area exceeding 500$m^2$.

**Recycling or recovery of waste**

(4) The scrapping or recovery of motor vehicles at a facility that has an operational rea in excess of 500$m^2$.

(5) The extraction, recovery or flaring of landfill gas.

(6) The sorting, shredding, grinding, crushing, screening or baling of general waste at a waste facility that has an operational area that is 1000$m^2$ and more. ”

### 3.1.15 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Domestic Waste Collection Standards, Government Notice 33935, 21 January 2011

The purpose of this publication is to redress past imbalances in the provision of waste collection services. The provision of waste collection services improves the quality of life of the entire community and ensures a clean and more acceptable place to live and work in. The lack of or poor quality waste collection services can however result in a number of environmental and human health problems.

It is recognised that South Africa is a developing country and the purpose of the setting of standards is to ensure a service to all while complying with health and safety regulations without unnecessarily changing current creative collection processes as long as they function well and deliver a service of acceptable standard to all households. These National Domestic Waste Collection Standards are therefore applicable to all domestic waste collection services throughout the country.

This notice distinguishes between the levels of service relating to waste collection. It further states that equitable waste collection services must be provided to all households within the jurisdiction of the municipality. In areas where travelling distances and the resulting costs may render regular waste collection services impractical, the municipality, through by-laws, must allow for more feasible alternative ways of waste handling, such as on-site disposal.

From here regulations and guidelines on separation at source, collection of recyclable waste, receptacles, bulk containers, communal collection points, and frequency of collection, drop-off centres and collection vehicles are given.

Existing Occupational Health and Safety legislation must be adhered to and the general health of waste collection workers must be addressed by ensuring they receive:

(i) regular medical check-ups to ensure their health and well-being;
(ii) appropriate personal protective equipment e.g. gloves, masks, overalls and raincoats, gumboots; and
(iii) on-going training on health and safety issues.

The role of the Waste Management Officer regarding waste awareness and the handling of complaints are prescribed. The municipality must create awareness amongst households about the following:

(i) the types of waste collection services provided;
(ii) Separation at source - the removal of recyclables and re-usable waste from the general household waste;
(iii) The potential of composting of some of the household waste and the benefit of such to the household;
(iv) The unacceptability of illegal dumping and littering;
(v) Measures to be taken against individuals that litter and dump waste illegally;
(vi) The cost of cleaning up illegal dumping and littering, and the implications on household waste collection rates; and
(vii) The advantages of reporting illegal dumping activities.

The municipality must provide clear guidelines to households about the following:

(i) The different types of waste generated in households;
(ij) separation of non-recyclable and non-reusable household waste from compostable waste and recyclable waste;
(iii) Appropriate containers for each type of waste;
(iv) Removal schedules for each type of waste; and
(v) What to do with waste other than those waste forming part of the regular schedule of waste collection services.

Awareness raising and guideline communications must be done at regular intervals to ensure that all households are well informed about the issues listed above.

The Waste Collection customer service standards for Kerbside collection are described with respect to collection schedule, interruptions, the replacement of bins, collection during holidays and general points.

### 3.1.16 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Waste Information Regulations, Government Notice 35583, 13 August 2012

The purpose of the Regulations is to regulate the collection of data and information to fulfil the objectives of the national waste information system set out in section 61 of the Act.

The Regulations apply uniformly to all persons conducting an activity listed in Annexure A of the Regulations. A person who conducts an activity in a province that has an established waste information system in terms of section 62 of the Act and collects the minimum information required by the Regulations must submit the information to the provincial waste information system.

Where a province has developed waste information regulations that are compatible with the Regulations, a person who conducts an activity contemplated in Annexure A to the Regulations must comply with the provincial waste information regulations.

### 3.1.17 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): Waste Classification and Management Regulations, Government Notice 36784, 23 August 2013

The purpose of the Regulations is to regulate the classification and management of waste in a manner which supports and implements the provisions of the Act; to establish a mechanism and procedure for the listing of waste management activities that do not require a Waste Management Licence; to prescribe requirements for the disposal of waste to landfill; to prescribe requirements and timeframes for the management of certain wastes and to prescribe general duties of waste generators, transporters and managers. It is stated in the Regulations that waste transporters and waste managers must not accept waste that has not been classified in terms of regulation 4 unless such a waste is listed in Annexure A of the Regulations.

Chapter 2 of the Notice covers Waste Classification and Safety Data Sheets. This regulation imposes an obligation on waste generators to prepare safety data sheets for all hazardous waste.

Chapter 3 covers Waste Management in General, Waste Treatment and Waste Disposal to Landfill. Waste Transporters and Waste managers must NOT accept waste that has not been classified in terms of Section 4 unless such waste is listed in Annexure A of the Regulations.

Chapter 4 covers Waste Management Activities that do not require a Waste Management Licence. With reference to section 4: Waste classification: Wastes which were not previously classified in terms of the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste, 2nd Edition 1998 must be classified in terms of SANS 10234 within 18 months from the publication of the regulations, thus on or before 23 February 2015. Wastes which were previously classified in terms of the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste, 1998 must be classified in terms of SANS 10234 within 3 years from the publication of the regulations of 23 August 2013 (thus on or before 23 August 2016).

The safety data sheets for wastes listed in item 2(b)(i) of Chapter 7: Annexure A must be prepared (in accordance with SANS 10234) for the product the waste originates from. The safety data sheets for hazardous waste, must be prepared (in accordance with SANS 10234) reflecting the details of the specific hazardous wastes or hazardous chemicals in the waste.

Chapter 5 covers the Record Keeping and Waste Manifest System:

10(1) the waste **generators** must keep accurate and up to date records of the management of the waste generated, the records must reflect:-
- (a) The classification of the waste
- (b) The quantity of each waste generated in tonnes or cubic metres per month;
- (c) The quantity of each waste that has been re-used, recycled, recovered, treated or disposed of, and
- (d) By whom the waste was managed

10(2) the sub regulation does not apply to item 2(a) of Annexure A *(general waste*)

11(4) Waste Transporters must NOT accept waste that has not been classified in terms of Section 4(2) or waste that has been listed in 2(b) of Annexure A of the Regulations for Transport unless the Waste Manifest Document accompanies the Waste

11(5) All transporters of hazardous waste in terms of Regulation 4(2) or waste that is listed in item 2(b) of Annexure A to the Regulations must:-
- (a) Complete a waste manifest for each consignment of waste transported
- (b) Provide information to the generator before the waste is transported from the premises
- (c) Provide the information to the facility waste manager at the time of delivery.

11(8) all waste generators, transporters and managers subjected to the requirements of sub-regulation 1, 2, 4, 5, 6 and 7 must-
- (a) Retain copies or be able access copies/records, of the waste manifest document for at least (5) years.

Chapter 6 covers General Matters which includes Implementation and Transitional Provisions and Offences and Penalties.

Chapter 7 contains the following Annexures:

Annexure A: Wastes that do not require Classification or Assessment

(2) General waste.
- (i) Domestic Waste;
- (ii) Business waste not containing hazardous waste or hazardous chemicals;
- (iv) Non-infectious animal carcasses;
- (iv) Garden waste;
- (v) Waste packaging;
- (vi) Waste tyres;

(vii) Building and demolition waste not containing hazardous waste or hazardous chemicals; and
(viii) Excavated earth material not containing hazardous waste or hazardous chemicals.

(3) Hazardous waste
(i) Waste Products;
Asbestos
PCB or PCB containing waste
Expired, spoiled or unusable hazardous products
(ii) Mixed waste
General waste excluding domestic- that may contain hazardous waste or hazardous chemicals.
Mixed hazardous chemical wastes from analytical laboratories and laboratories from academic institutions less than 100 litre.
(iii) Other:
Health Care Risk Waste (HCRW)

Annexure B: Waste Manifest System Information Requirements

(1) The information required in (2) must be reflected in the Waste Manifest Document required in terms of Regulation 11.
(2) (a) Information supplied by the waste generator(consignor):
(i) Unique consignment identification number
(ii) South African Waste Information Number (SAWIS), if applicable
(iii) Generator's contact details
(iv) Physical address of site where the waste was generated
(v) Contact number
(vi) Origin/source of the waste. (process or activity)
(vii) Classification of the waste (*SANS 10234*) and Safety Data Sheet (SDS)
(viii) Quantity of waste by volume or tonne
(ix) Date of collection/dispatch
(x) Intended receiver (waste Manager)
(xi) Declaration (content of the assignment is fully and accurately described, classified, packed, marked and labelled, and in all respects in a proper condition for transportation in accordance with the applicable by-laws and applications
(b) Information to be supplied to the waste Transporter:
(i) Name of transporter
(ii) Address and telephone number
(iii) Declaration acknowledging receipt of the waste.
(c) Information supplied by the waste manager (consignee):
(i) Name, address and contact details
(ii) Receiving facility details
(iii) Waste management facility licence number
(iv) Date of receipt
(v) Quantity of waste received
(vi) Type of waste management applied
(vii) Any discrepancies in information between the different holders of waste
(viii) Waste management reporting description and code in terms of the National Waste Information Regulations 2012
(ix) Details on any waste diverted to another facility
(x) Certification and declaration of receipt and final management of waste.

### 3.1.18 National Environmental Management: Waste Act, 2008 (Act no. 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 requirements for the assessment of waste prior to disposal to landfill in terms of Regulation 8(1) (a) of the Regulations.

The Standard Assessment methodology to assess waste for the purpose of disposal to landfill the following are required:

- Identification of chemical substances present in the 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 the Norms and Standards.

Within 3 years of the date of commencement of the Regulations, all analyses 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 these Norms and Standards. Based on the TC and LC limits the specific type of waste for disposal to landfill must be determined in terms of section 7.

### 3.1.19 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for Disposal of Waste to Landfill, Government Gazette no. 36784, 23 August 2013

The purpose of the Norms and Standards are to determine the requirements for the disposal of waste to landfill as contemplated in regulation 8(1)(b) and (c) of the Regulations.

Chapter 2 describes and illustrates the Landfill Classification and corresponding minimum engineering design requirements for the Containment Barriers. These are for Class A to Class D landfills. The requirements that are to be included in an application for a waste management license are stipulated.

The waste acceptance criteria for disposal to landfill are summarised as follows:

Waste assess in terms of the Norms and Standards for Assessment of Waste for Landfill Disposal set in terms of section 7(1) of the Act must be disposed to a licensed landfill as follows:

| Waste Type | Landfill Disposal Requirements |
|---|---|
| Type 0 | Disposal to landfill not allowed |
| Type 1 | Disposed at Class A landfill or H:h/H:H landfill as specified |
| Type 2 | Disposed at Class B landfill or G:L:B+ landfill as specified |
| Type 3 | Disposed at Class C landfill or G:L:B+ landfill as specified |
| Type 4 | Disposed at Class D landfill or G:L:B- landfill as specified |

Waste listed in section 2(a) of Annexure A to the Regulations must be disposed as follows:

| Listed Waste | Landfill Disposal Requirements |
|---|---|
| Domestic waste. Business waste not containing hazardous waste or hazardous chemicals. Non-infectious animal carcasses. Garden waste. | Disposed at Class B landfill or G:L:B+ landfill as specified |
| Post-consumer packaging. Waste tyres. | Disposed at Class C landfill or G:L:B+ landfill as specified |
| Building and demolition waste not containing hazardous waste or hazardous chemicals. Excavated earth material not containing hazardous waste or hazardous chemicals. | Disposed at Class D landfill or G:L:B- landfill as specified |

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 A to the Regulations must be disposed as follows:

| Listed Waste | Landfill Disposal Requirements |
|---|---|
| Asbestos waste; Expired, spoilt or unstable 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 100 litres. | Disposed at Class A landfill or H:h/H:H landfill as specified |

Waste that has been classified in terms of the Minimum Requirements for the Handling, Classification and Disposal of Hazardous Waste (2nd Edition, 1998; DWAF) prior to the Regulations coming into operation, may be accepted and disposed of as set out below for a period not exceeding 3 years after the date of coming into operation of the Regulations:

| Waste | Landfill Disposal Requirements |
|---|---|
| Hazardous Waste - Hazard Rating 1 or 2 | Disposed at Class A landfill or H:H landfill as specified |
| Hazardous Waste - Hazard Rating 3 or 4 | Disposed at Class A landfill or H:h landfill as specified |
| Hazardous Waste - Delisted | Disposed at Class B landfill or G:L:B+ landfill as specified |
| General Waste | Disposed at Class B landfill or G:S/M/L:B-/B+ landfill as specified |

The Norms and Standards 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 the Regulations coming into operation.

**3.1.20 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): Fee Structure for Consideration and Processing of Applications for Waste Management Licences, Transfer and Renewal thereof, Government Gazette No. 37383, 28 February 2014**

These regulations apply to the above application excluding community based projects funded by government grants or applications made by organs of state. The commencement date is 1 April 2014. Payment details are discussed regarding the different applicable fees which are listed as follows:

| Application | Fee |
|---|---|
| Application for a waste management license for which basic assessment is required in terms of the Act. | R200.00 |
| Application for a waste management license for which S&EIR is required in terms of the Act. | R10 000.00 |
| Application for a transfer of a waste management license in terms of section 52(2) or for the renewal of a waste management license in terms of section 55(2) of the Act. | R2 000.00 |

**3.1.21 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and standards for the Extraction Faring or Recovery of Landfill Gas, Government Gazette No. 37086, 29 November 2013**

The purpose of these Norms and Standards is to aim at controlling the flaring, extraction or recovery of landfill gas at facilities in order to prevent or minimise the potential negative impacts on the bio-physical and socio-economic environments. It describes how these facilities must be designed, operated, monitored and decommissioned.

**3.1.22 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for the Scrapping or Recovery of Motor Vehicles, Government Gazette No. 37087, 29 November 2013**

These Norms and Standards are applicable to a vehicle scrapping or recovery facility with an operational area exceeding 500m$^2$ and describes how such a facility must be designed, operated, monitored and decommissioned.

**3.1.23 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for the Storage of Waste, Government Gazette No. 37088, 29 November 2013**

The purpose of these Norms and Standards is to provide a uniform national approach to the management of waste storage facilities, ensure best practice and to provide minimum standards for the design and operation of new and existing facilities. These Norms and Standards are applicable to waste storage facilities that have the capacity to store in excess of 100m$^3$ general waste continuously or 80m$^3$ of hazardous waste continuously.

**3.1.24 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): DRAFT National Norms and Standards for Organic Waste composting, government gazette no. 37300, 7 February 2014**

These draft Norms and Standards are applicable to organic waste composting facilities that have the capacity to process in excess of 10 tonnes but less than 100 tonnes of compostable organic waste per day and describes how such a facility must be designed, operated, monitored and decommissioned.

**3.1.25 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for the Remediation of Contaminated Land and Soil Quality, Government Gazette No 37603, 2 May 2014**

The purpose of these Norms and Standards is provide a uniform national approach to determine the contamination status of an area and to limit uncertainties about the most appropriate criteria and method to apply in such an assessment. Also provide minimum standards for assessing necessary environmental protection measures for remediation activities.

**3.1.26 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and Standards for the sorting, shredding, grinding, crushing, screening or baling of general waste, Government Gazette No. 41175, 11 October 2017**

The purpose of these norms and standards is to provide a uniform national approach relating to the management of waste facilities that sort, shred, grind, crush, screen, chip or bale general waste and applies to a waste facility that has an operational area that is 1000m$^2$ and more.

It requires any new facility to register with the competent authority within 90 days prior to construction taking place and it allows for any existing facilities that undertake these activities, and which are already registered in terms of the National Norms and Standards for Storage of waste, to comply with the norms and standards without having to re-register.

A waste facility that is less than 1000m$^2$ must register with the competent authority and comply with the principle of duty of care as contained in Section 28 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) and Section 16(1) and 16(3) of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008).

**3.1.27 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): List of Waste Management Activities that has or is likely to have a detrimental effect on the Environment Government Notice 37604, 2 May 2014**

The Waste Management Activities List under paragraph 2.15 above has been amended by the deletion of Category B activity 3 (8).

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

The main criterion for determining the qualifying recipients of Basic Refuse Removal (BRR) services is registration on a municipality's indigent register as provided for by the indigent policy of the municipality.

The following criteria can be used in the absence of or in addition to the main criterion to determine the qualifying recipients of the BRR services:

- Level of income: Monthly net household income of members of less than or equal to *two old age pensions (including children/individuals who may get state grants).*
- Residence status: Everybody residing in the municipality provided their indigent status have been verified.
- Special considerations: All child headed households, households headed by pensioners and people with disabilities.
- Value of property (need to note that inherited properties might give false income level status).
- Any other criteria as determined by the specific municipality

A municipality may for practical reasons, declare certain areas or clusters as qualifying recipients of BRR. Examples may include low-income areas and high density, urban informal areas.

- Such declarations have added advantages in terms of administrative feasibility (logistics and costs included) especially where rate collection is challenging.
- A municipality may declare certain low density rural areas as areas where on-site disposal is deemed to be an appropriate waste management option.

If the recipient dos not fall under a qualifying indigent area, he/she may register as an indigent at his/her municipality. The municipality must set out certain dates/times for these registrations.

### 3.1.29 White paper: policy on pollution prevention, waste minimisation, impact management and remediation (March 2000)

In line with international trends and our national objectives of efficient and effective management of our nation's resources, priority is given to prevention of waste. Unlike previous policies that focused predominantly on so called "end of pipe" treatment, this White Paper underscores the importance of preventing pollution and waste and avoiding environment degradation.

Effective mechanisms to deal with unavoidable waste will remain necessary, but much greater attention must be directed to the introduction of preventative strategies aimed at waste minimisation and pollution prevention. Ever increasing urban and industrial development throughout the world is leading to levels of pollution, which seriously threaten the natural resources upon which humankind depends for its survival.

Although South Africa has extensive environment, pollution and waste management legislation, responsibility for its implementation is scattered over a number of departments and institutions.

The fragmented and uncoordinated way pollution and waste is currently being dealt with, as well as the insufficient resources to implement and monitor existing legislation, contributes largely to the unacceptably high levels of pollution and waste in South Africa.

The White Paper on Integrated Pollution and Waste Management will result in a review of the existing legislation and the preparation of a single piece of legislation dealing with waste and pollution matters.

Pollution and waste management is not the exclusive preserve of government. The private sector and civil society have crucial roles to play. The fostering of partnerships between government and the private sector is a prerequisite for sustainable and effective pollution and waste management to take place. Similarly, the spirit of partnerships and co-operative governance between organs of state is equally important due to the crosscutting nature of pollution and waste management.

Monitoring and collection of information on pollution and waste generation are crucial for the implementation of pollution and waste reduction measures. Moreover, the sharing of such information and creating awareness about the issues will enable all stakeholders, including communities, to gain a better understanding of the relation between pollution, waste management and the quality of life.

**The White Paper proposes a number of tools to implement the objectives of the policy it sets out. The most significant of these is a legislative programme that will culminate in new pollution and waste legislation. This proposed legislation, amongst other things, will address current legislative gaps, and clarify and allocate responsibilities within government for pollution and waste management.**

The policy presents seven strategic goals, which are as follows:

Goal 1: Effective Institutional Framework and Legislation
Goal 2: Pollution Prevention, Waste Minimisation, Impact Management and Remediation
Goal 3: Holistic and Integrated Planning
Goal 4: Participation and Partnerships Governance in Integrated Pollution and Waste Management
Goal *5:* Empowerment and Education in Integrated Pollution and waste Management
Goal 6: Information Management
Goal 7: International Cooperation

**The role of Local Government**

Municipalities will be responsible for providing waste management services, and managing waste disposal facilities. Specific functions to be carried out by municipalities will include:

- compiling and implementing general waste management plans, with assistance from provincial government
- implementing public awareness campaigns
- collecting data for the Waste Information System
- providing general waste collection services and managing waste disposal facilities within their areas of jurisdiction
- implementing and enforcing appropriate waste minimisation and recycling initiatives, such as promoting the development of voluntary partnerships with industry, including the introduction of waste minimisation clubs where possible, regional planning, establishment and management of landfill sites, especially for regionally based general waste landfills.

### 3.1.30 Planning documents

*The Western Cape Provincial Spatial Development Framework (March 2014)*

The Western Cape Provincial Spatial Development Framework (PSDF) states that if the increasing amounts of waste generated are not minimised, it will give rise to the need for more disposal sites which is not desirable. A mind set of "reduce, rethink, recycle" still needs to be mainstreamed and further challenges are created by illegal dumping, shortfalls in hazardous waste facilities, growing informal settlements and a lack of recyclables collection from homes. The following provincial spatial policies related to waste management are included:

Policy R4: Recycle and recover waste, deliver clean sources of energy to urban consumers, shift from private to public transport, and adapt to and mitigate against climate change.

1. Unlock economic opportunities and increase the lifecycle of current disposal sites and apply the principles of "reduce, reuse, and recycle".
2. Close down illegal sites and locate new regional waste sites adjacent to rail facilities to decrease operational costs and energy requirements associated with the need for road freight.

*The OneCape 2040*

OneCape 2040 was developed by the Western Cape Economic Development Partnership (EDP) for the Western Cape Government (WCG) and the City of Cape Town (CCT). The purpose is to encourage and provide a vision for a more inclusive and resilient economic future for the Western Cape. It does not replace any existing statutory plans required of province or municipalities, but is intended as a guideline for stakeholders in order to:

- Promote fresh thinking and critical engagement on the future;
- Provide a common agenda for private, public and civil society collaboration;
- Help align government action and investment decisions;
- Facilitate the necessary changes we need to make to adapt to our (rapidly) changing local and global context;
- Address our development, sustainability, inclusion and competitiveness imperatives.

Under the Ecological transition, the goal is that all people have access to water, energy and waste services that are delivered in a sustainable resource-efficient manner.

*The Western Cape Provincial Strategic Plan (2014 – 2019)*

The Plan is aligned with the NDP, PSDF and also the OneCape 2040. The following Provincial Strategic Goals are set out in the document:

- Strategic Goal 1: Create opportunities for growth and jobs.
- Strategic Goal 2: Improve education outcomes and opportunities for youth development.
- Strategic Goal 3: Increase wellness, safety and tackle social ills.
- Strategic Goal 4: Enable a resilient, sustainable, quality and inclusive living environment.

- Strategic Goal 5: Embed good governance and integrated service delivery through partnerships and spatial alignment.

*The Western Cape Green Economy Strategy Framework*

The Green Economy Strategy Framework is about achieving the double dividend of optimising green economic opportunities and enhancing our environmental performance. The framework is for the Western Cape to become the lowest carbon province and leading green economic hub of the African continent.

"Drivers" and "Enablers" are identified in the Framework as listed below:

Drivers:

- Smart living and working
- Smart mobility
- Smart eco-systems
- Smart agri-production
- Smart enterprise

Enablers:

- Finance
- Rules and Regulation
- Knowledge Management
- Capabilities
- Infrastructure

### 3.1.31 International treaties

This section lists the international agreements to which South Africa has acceded. The following is as described in section 4.10 of the National Waste Management Strategy 2011:

Various international agreements to which South Africa has acceded relate to waste management. A number of non-binding conventions and protocols are also relevant to waste management. This section summarises the main actions in the NWMS related to implementing international agreements.

#### 3.1.31.1 The Basel Convention

The Basel Convention, adopted in 1989, has the greatest bearing on the Waste Act as it addresses the trans-boundary movement of hazardous wastes and their disposal, setting out the categorization of hazardous waste and the policies between member countries.

DEA is developing MOUs with the International Trade Administration Commission (ITAC) and the South African Revenue Service (SARS) that effectively address the provisions of the Basel Convention.

DEA is considering accession to the amendments to the Basel Convention that ban the import and export of hazardous wastes. DEA is also currently developing a policy on imports and exports of waste that will address this.

DEA and DTI are jointly addressing the import and export control aspects of the Basel Convention, together with the chemical conventions. Control will happen through ITAC permits and SARS tariff codes.

#### 3.1.31.2 The Montreal Protocol

The Montreal Protocol Treaty, revised in 1999, protects the ozone layer by phasing out the production of several substances that contribute to ozone depletion, with the aim of ozone layer recovery by 2050. This has relevance for waste management in instances where such obsolete products enter the waste stream. DEA will finalise and publish the National Implementation Plan for the Montreal Protocol. The plan will include the development on an Ozone Depletion Substance (ODS) strategy and regulations will provide for the phasing out of specified substances and their safe disposal.

#### 3.1.31.3 The Rotterdam Convention

The Rotterdam Convention promotes and enforces transparency in the importation of hazardous chemicals and whilst it explicitly excludes waste, its implementation may lead to bans on listed chemicals. Some of these chemicals may occur in stockpiles of obsolete chemicals such as pesticides that have been identified as a major waste management challenge. Extended producer responsibility schemes will be used to effectively manage obsolete chemicals.

A study to investigate the extent of manufacture, use, import and export of new chemicals listed in the Rotterdam Convention will determine whether South Africa should ratify the newly added chemicals. This document will be finalised in 2012. A process to identify and ban pesticides and industrial chemicals listed in Annex lll (that South Africa has not yet banned) has started.

#### 3.1.31.4 The Stockholm Convention

The Stockholm Convention on Persistent Organic Pollutants (POPs), which entered into force in 2004, requires that member countries phase out POPs and prevent their import or export. Parties to the Convention are also required to undertake the following responsibilities:

- Develop and implement appropriate strategies to identify stockpiles, products and articles in use that contain or are contaminated with POPs.
- Manage stockpiles and wastes in an environmentally sound manner.
- Dispose of waste in a way that destroys or irreversibly transforms POPs content.
- Prohibit recycling, recovery, reclamation, direct re-use or alternative use of POPs.
- Endeavour to develop strategies to identify contaminated sites and perform eventual remediation in an environmentally sound manner.

### 3.1.32 Municipal By-laws

The Bergrivier Municipality's solid waste by-laws is attached as **Annexure A**. These by-laws were drafted in 2009 and are outdated. A revision to comprehensive integrated waste management by-laws is strongly recommended.

### 3.1.33 Discussion of legislation (effectiveness & implementation)

The above listed legislation (national, international and local by-law) provide comprehensive rule-sets by which the solid waste life-cycle and the management thereof are governed. Although there is always room for improvement, it can be argued that South African solid waste legislation is of a high standard and is comparable internationally. We must therefore ask to what extent is solid waste legislation implemented and, if possible, how to ensure compliance by all and what are the stumbling blocks. Without compliance with the above legislation we will not be able to create a sustainable future for the stunning and diverse natural South African environment.

In South Africa's history the more comprehensive legislation and knowledge of better waste management practices are relatively "new" and therefore still in the stages of establishing a secure foothold in our society. Past waste management practices have in essence created a "back-log" of acceptable waste management practices and in many ways, the current generations are now required to address the complications created by old methods, poor management or uninformed decisions. A great number of instances of non-compliances to legislation are a direct result of pre-legislation practices that were not addressed, which can be due to various factors, and are still in some places the norm.

Legislation enforcement on a local level will almost definitely be lacking without the willing co-operation from the public and industry. In a rural Municipality such as Bergrivier, with vast open spaces between towns and even within towns, the capacity of law enforcement is limited. There is simply not enough man-power to monitor all areas and prevent illegal practices. Illegal dumping is of concern and should be reported to the Municipality. With reference to the public comments received, illegal dumping is a nuisance in some areas and the public requires that law enforcement is better applied in the form of issuing fines to the offenders.

In terms of the hazardous waste compliance and implementation of relevant legislation, the following was observed during the survey (Hazardous waste further discussed under 3.3):

#### 3.1.33.1 Compliance with Legislation

Apart from the heath care risk waste stream, the amount of hazardous waste in the Bergrivier Municipality is very limited. The data contained in this survey was obtained from owners/employees at the various places of business directly and it must be noted that there is a general lack of knowledge regarding the legislation surrounding waste generation or disposal throughout the entire spectrum of Industrial Groups. The Healthcare Risk Waste group seemed to have more of an understanding of what is required from them and generally they are in compliance with the Western Cape Health Care Risk Waste Act (Act 7 of 2007).

The majority of hazardous waste generators are not fully aware of the NEMWA requirements and rely on the transporters of the waste to ensure compliance.

#### 3.1.33.2 General

In general, the pressure on law enforcement will be lessened with the continued awareness and education of the public, industry and all generators of waste. All parties MUST realise their part in the waste management cycle and accept accountability, so that the response to legislation and waste management practices is not “why?”, but “how?”. The “how” will have to be continually addressed through education as new technologies, practices, waste types and opportunities emerge. The waste industry cannot afford to get comfortable and settle on “that is how it has always been done”, but must be innovative, up-to-date and achieve co-operation between all spheres of society in order to ensure the sustainable future of our environment.

The legislation is therefore sufficient, but compliance must be improved through awareness and education and improved enforcement. The public must also assist the Municipality and report all instances where the law is not obeyed. Instances related to solid waste can be reported to the Municipality on Tel: (022) 913 6000.

Another aspect to consider is affordability. As mentioned, certain practices were the norm in previous years, but are drastically affected by recent legislation. The DEADP conducted a project in order to estimate the costs of compliance for Western Cape municipalities relating to solid waste infrastructure alone. The estimates are considered unaffordable in the short to medium term. In these cases assistance is required or Municipalities must be given sufficient time in order to be compliant.

All of the Bergrivier Municipality’s disposal facilities are licensed and therefore in that respect compliant with legislation. The extent of implementation of the licence requirements must be assessed via regular internal and external audits of the facilities. The audit results will determine the requirements for each facility and cost estimates can be made for budget purposes.

## 3.2 DEMOGRAPHICS

The demographics and related statistics were obtained from Statistics SA and, with permission from DEADP, the *Western Cape Population Projections: 2011 – 2040, March 2014,* by PwC.

### 3.2.1 Current and projected population and density

The 2011 Census figures indicate that the Bergrivier Municipality had a total population of 61 896 people with a 2.85% annual population growth rate since the 2001 Census. The abovementioned PWC population projections report indicates that the 2018 Bergrivier population estimate stands at 68 754 people, which is 15.86% of the total West Coast District 2018 population estimate (433 447) and 1.09% of the total Western Cape Province 2018 population estimate (6 332 238).

The Census 2011 statistics are available in terms of sub-places into which the Municipality was divided for the study. The abovementioned PwC population projection study for the Western Cape did not include data for sub-places, but did provide total projections per municipality up to the year 2040. A fixed growth rate per annum was not used, but different factors such as fertility, mortality and migration were taken into account resulting in a different population growth rate for each year.

For this IWMP report the population and household totals per sub-place of the 2011 Census were reworked in order to align this IWMP with the projected population for each year as per the PwC report, with the assumption that the sub-places would grow in proportion to the total population.

The PWC report indicates an average annual population growth rate of 1.11% (2011 – 2040) for Bergrivier Municipality which is significantly lower than the 2.85% from Census 2011 (calculated from 2001 to 2011). Since Municipal IWMP planning cycles are every 5 years, it was decided to use the PWC average population growth rate for the first 10 years of their study (2011 – 2021) when calculating population growth for the Bergrivier Municipality relevant to this IWMP. An annual population growth rate of 1.43% was thus used for all population calculations in this IWMP.

The current and projected populations per sub-place based on the above assumptions are shown in **Table 3.1** below:

**Table 3.1: Current and projected population of Bergrivier per sub-area**

| Sub-area | 2011 | 2018 | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|---|---|
| Redelinghuys SP | 576 | 636 | 645 | 655 | 664 | 674 |
| Bergrivier NU | 24 390 | 26 942 | 27 328 | 27 720 | 28 117 | 28 519 |
| Great Winterhoek Forest Reserve | 108 | 119 | 121 | 123 | 125 | 126 |
| Eendekuil SP | 1 530 | 1 690 | 1 714 | 1 739 | 1 764 | 1 789 |
| Dwarskersbos SP | 669 | 739 | 750 | 760 | 771 | 782 |
| Aurora SP | 576 | 636 | 645 | 655 | 664 | 674 |
| Noordhoek | 7 138 | 7 885 | 7 998 | 8 112 | 8 229 | 8 346 |
| Laaiplek | 579 | 640 | 649 | 658 | 667 | 677 |
| Velddrif SP | 2 119 | 2 341 | 2 374 | 2 408 | 2 443 | 2 478 |
| Admiral Island and Port Owen Estates | 1 179 | 1 302 | 1 321 | 1 340 | 1 359 | 1 379 |
| Goedverwacht SP | 1 981 | 2 188 | 2 220 | 2 251 | 2 284 | 2 316 |
| Beaverlac Nature Reserve | 60 | 66 | 67 | 68 | 69 | 70 |
| Piketberg SP | 12 072 | 13 335 | 13 526 | 13 720 | 13 916 | 14 116 |
| De Hoek Mine | 330 | 365 | 370 | 375 | 380 | 386 |
| Wittewater SP | 852 | 941 | 955 | 968 | 982 | 996 |
| Porterville SP | 7 057 | 7 796 | 7 907 | 8 020 | 8 135 | 8 252 |
| Voorberg Correctional Services | 680 | 751 | 762 | 773 | 784 | 795 |
| **Total** | **61 896** | **68 373** | **69 353** | **70 346** | **71 353** | **72 375** |

*-SP = Sub-place*
*-NU = Non-urban*

From the above table, the population densities in Bergrivier can be graphically displayed as per **Figure** 3.1. The majority of the population resides in rural areas (39%), followed by Piketberg (20%) and the coastal areas of Velddrif, Noordhoek etc. The total average population density for the whole of Bergrivier is 15.5 persons per $km^2$.

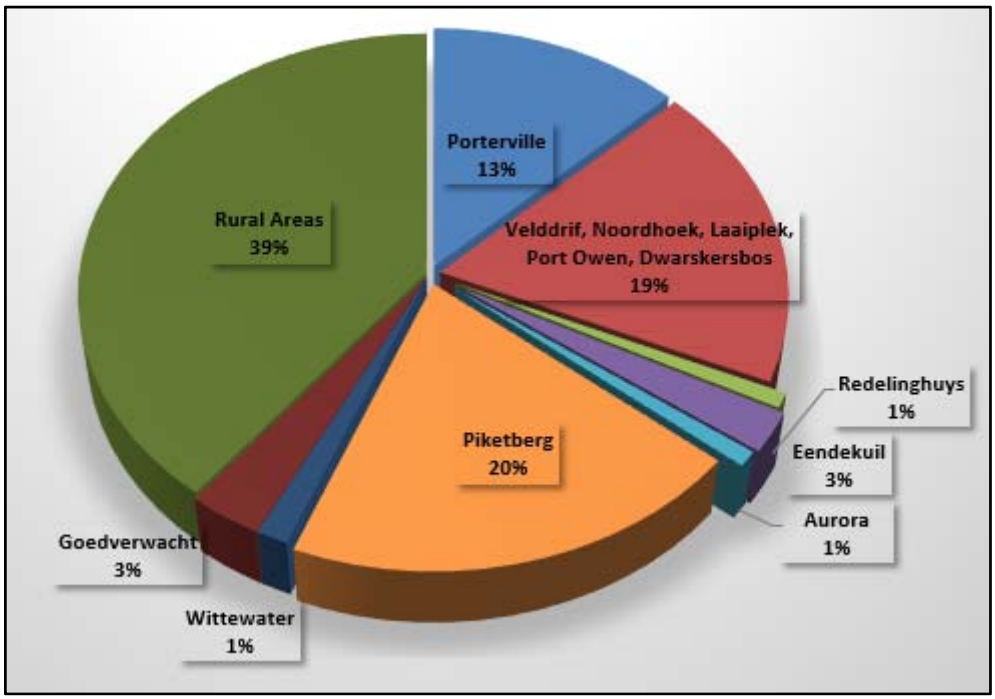



**Figure 3.1: 2018 Population density per sub-place**

**Figure 3.2** below shows the graphical representation of the Bergrivier population growth up to 2040 based on the above information.

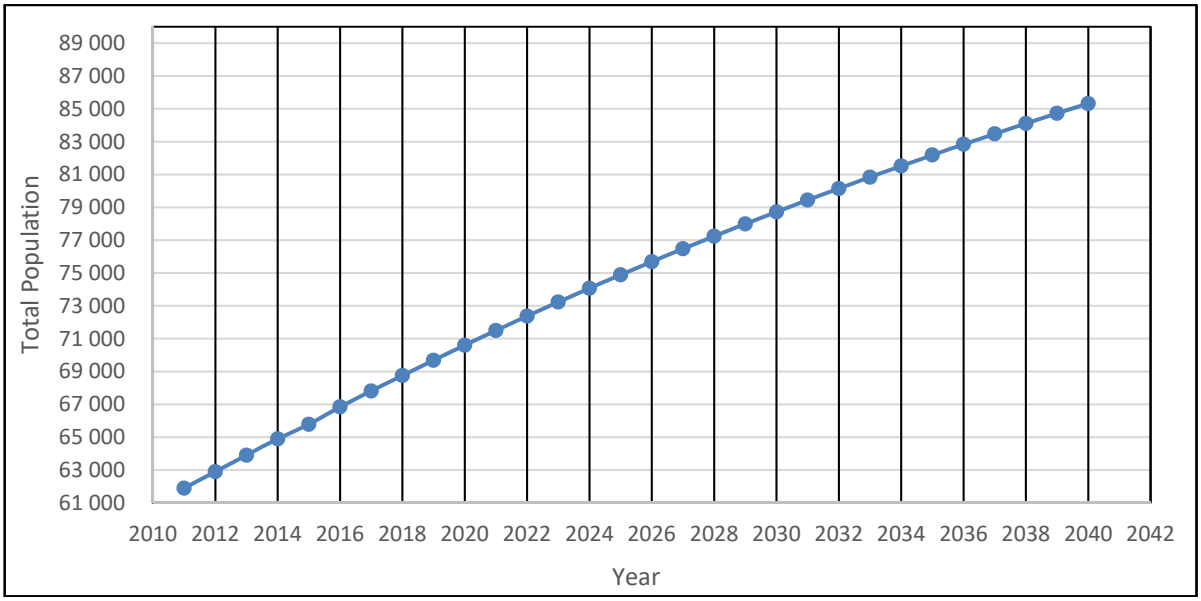



**Figure 3.2: Bergrivier Projected Population**

### 3.2.2 Socio-economic profile and education

**Table 3.2** shows the 2011 socio-economic profile of the Bergrivier municipality according to annual household income obtained from Census 2011. In order to estimate the current number of households, the assumption was made that the average number of persons per household for each sub-area would remain constant.

The graphical distribution of the socio-economic situation within the Bergrivier Municipality is shown on **Figure 3.3** on the following page.

**Table 3.2: Population Profile According to Household Income (2011 & Estimated 2018)**

| Sub-area | No of Households (2011) | Population (2011) | Persons per Household | Very Low and Low Income (R0 - R38 400) | Middle Income (R38 401 - R76 800) | High and Very High Income (R76801 or more) | No of Households (2018) | Population (2018) |
|---|---|---|---|---|---|---|---|---|
| Redelinghuys SP | 138 | 576 | 4.2 | 56.5% | 23.9% | 19.6% | 153 | 636 |
| Bergrivier NU | 5 769 | 24 390 | 4.2 | 56.3% | 24.3% | 19.4% | 6 373 | 26 942 |
| Great Winterhoek Forest Reserve | 24 | 108 | 4.5 | 0.0% | 37.5% | 62.5% | 3 | 119 |
| Eendekuil SP | 375 | 1 530 | 4.1 | 39.2% | 36.0% | 24.8% | 415 | 1 690 |
| Dwarskersbos SP | 207 | 669 | 3.2 | 42.0% | 13.0% | 44.9% | 229 | 739 |
| Aurora SP | 192 | 576 | 3.0 | 56.3% | 18.8% | 25.0% | 213 | 636 |
| Noordhoek | 2 058 | 7 138 | 3.5 | 62.1% | 19.8% | 18.1% | 2 274 | 7 885 |
| Laaiplek | 261 | 579 | 2.2 | 40.2% | 12.6% | 47.1% | 289 | 640 |
| Velddrif SP | 882 | 2 119 | 2.4 | 42.2% | 16.0% | 41.8% | 975 | 2 341 |
| Admiral Island and Port Owen Estates | 420 | 1 179 | 2.8 | 27.9% | 12.9% | 59.3% | 464 | 1 302 |
| Goedverwacht SP | 543 | 1 981 | 3.6 | 51.9% | 21.5% | 26.5% | 600 | 2 188 |
| Beaverlac Nature Reserve | 18 | 60 | 3.3 | 83.3% | 0.0% | 16.7% | 20 | 66 |
| Piketberg SP | 2 919 | 12 072 | 4.1 | 38.6% | 24.0% | 37.3% | 3 225 | 13 335 |
| De Hoek Mine | 111 | 330 | 3.0 | 16.2% | 16.2% | 67.6% | 123 | 365 |
| Wittewater SP | 189 | 852 | 4.5 | 44.4% | 28.6% | 27.0% | 209 | 941 |
| Porterville SP | 1 944 | 7 057 | 3.6 | 41.4% | 24.2% | 34.4% | 2 148 | 7 796 |
| Voorberg Correctional Services | 204 | 680 | 3.3 | 0.0% | 4.4% | 95.6% | 226 | 751 |
| **Total** | **16 254** | **61 896** | **3.8** | **48.41%** | **22.44%** | **29.14%** | **17 939** | **68 373** |

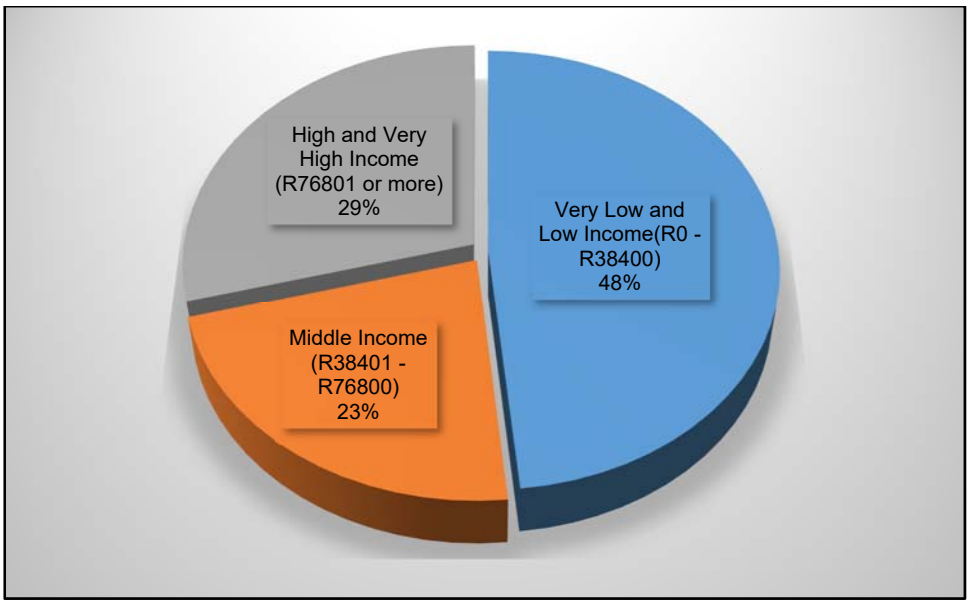



**Figure 3.3: Graphical Display of Socio-Economic Distribution**

According to Census 2011 the level of education in the Bergrivier Municipality is as follows:

**Table 3.3: Education levels**

| Population % | Level of education |
|---|---|
| 3.7% | No schooling |
| 41.3% | Some primary |
| 7.1% | Completed primary |
| 30.5% | Some secondary |
| 9.0% | Completed secondary |
| 0.8% | Higher education |
| 7.6% | Not applicable |

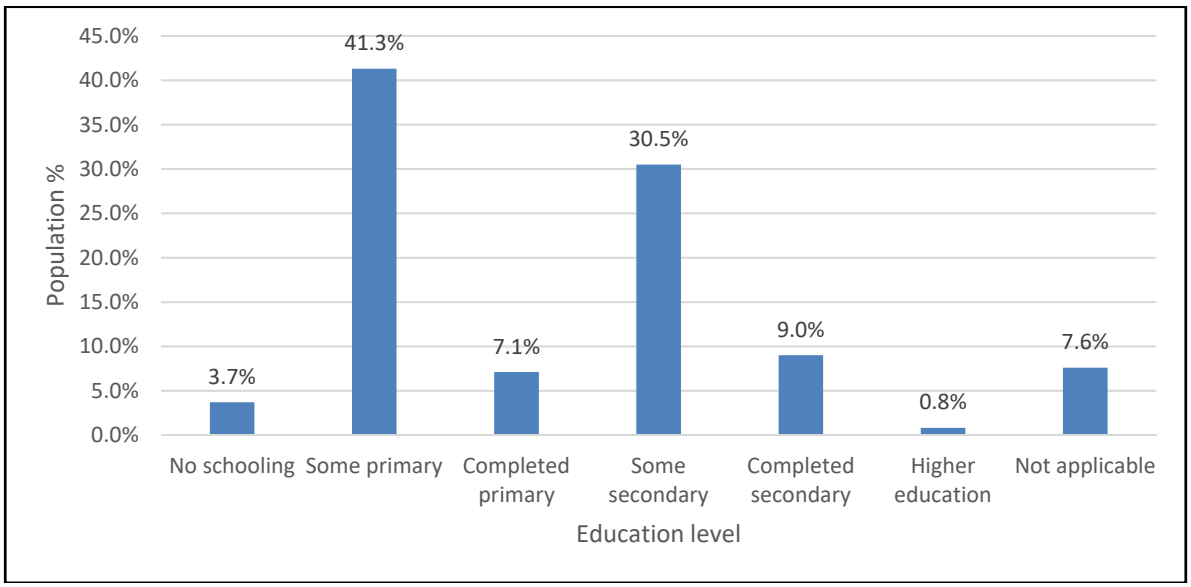



**Figure 3.4: Education levels**

From the above, it is further stated that education levels according to age of those aged 20 years and above, 6.4% have no form of schooling, 7.7% have some form of secondary education and 22.3% have completed matric.

### 3.2.3 Gender and age distribution

The population distribution according to gender and age is shown in **Table 3.4** below. The distribution is almost equal between males and females, with females slightly more in percentage than males.

**Table 3.4: Gender and Age Distribution**

| Age | Male (2011) | Female (2011) | Male (2018) | Female (2018) | Male (2023) | Female (2021) |
|---|---|---|---|---|---|---|
| **0-14** | 7 727 | 7 701 | 8 424 | 8 322 | 8 803 | 8 617 |
| **15-64** | 20 487 | 21 653 | 22 562 | 23 869 | 23 914 | 25 256 |
| **65+** | 1 844 | 2 484 | 2 406 | 3 171 | 2 838 | 3 806 |
| **Total** | 30 058 | 31 839 | 33 392 | 35 362 | 35 554 | 37 680 |
| **Ratio** | 48.6% | 51.4% | 48.6% | 51.4% | 48.5% | 51.5% |

### 3.2.4 Development

The planned and potential development were obtained from the 2014 Western Cape Growth Potential Study of Towns by the DEADP as well as the Bergrivier SDF.

**Table 3.5: Growth Potential Study Results**

| Area | Composite Growth Potential | Socio-economic needs index | Human Capital index | Economic index | Physical index | Infra-structure index | Institu-tional index |
|---|---|---|---|---|---|---|---|
| **Aurora** | Low | Very Low | Medium | Very Low | Medium | Low | High |
| **Goedverwacht** | Low | Low | Medium | Low | Medium | Low | High |
| **Redelinghuys** | Low | Very Low | High | Very Low | Low | Low | High |
| **Dwarskersbos** | Medium | Very Low | High | Very Low | Medium | High | High |
| **Eendekuil** | Medium | Very Low | Medium | Very Low | High | Low | High |
| **Piketberg** | Medium | Medium | High | Medium | Medium | Medium | High |
| **Velddrif** | Medium | Low | High | Low | Medium | High | High |
| **Porterville** | High | Medium | Very High | Medium | Very High | High | High |

These condensed results of the DEADP study indicate that the Bergrivier Municipality has a medium growth potential.

The different indexes indicated in the table above are all based on many different factors that was part of the study to determine those indexes, but are not discussed in detail here. The summary of what each index indicates are as follows:

Growth Potential: Determined by quantitative indicators relating to socio-economic needs, economic, physical-environmental, infrastructure, human capital and institutional aspects combined with qualitative information such as stakeholder engagements.

Socio-economic needs: Index determined by evaluating household services, education levels, housing needs and economic characteristics.

Human Capital index: Index determined by factors such as education and income.

Economic index: Index determined by factors such as per capita income, tourism, economically active population, etc.

Physical index: Index determined by factors such as annual rainfall, groundwater availability and quality, grazing capacity and growth of cultivated land, etc.

Infrastructure index: Index determined by factors such as household access to water, sanitation, electricity, waste removal and distances to airports and harbours, etc.

Institutional index: Index determined by factors such as crime rate, management capacity, qualified audits, etc.

From the above, the Bergrivier municipality therefore has an overall medium growth potential determined by the contributing factors. However, it remains important for the waste management department to be up to date with new and potential developments in the Municipality to ensure that the solid waste management system will have the required capacity to keep up with the growth.

## 3.3 WASTE CLASSIFICATION

The waste types and quantities generated in the Bergrivier Municipality are discussed in this section.

### 3.3.1 Waste types and classification

With reference to the Waste Act, *National Norms and Standards for Disposal of Waste to Landfill as well as Assessment of Waste for Landfill Disposal*, *23 August 2013,* the only types of waste allowed for disposal at Municipal disposal facilities are general or Type 2, 3 and 4 wastes. No Bergrivier municipal facilities are allowed to accept hazardous or Type 1 wastes. Even though the waste from Bergrivier gets disposed of outside the borders of the municipality, the facilities accepting their waste are municipal general waste landfill sites and thus the transfer stations in Bergrivier need to adhere to the same regulations.

### 3.3.2 Methodology

The Bergrivier Municipality do not make use of internal landfill sites for disposal anymore. The waste generated within the municipality gets collected and sent to either the Velddrif or Piketberg transfer stations from where it is taken to Vredenburg (from Velddrif) and Malmesbury (from Piketberg) Landfills.

The latest available waste quantities submitted to Vredenburg and Highlands (Malmesbury) Landfills were used. There is no operating weighbridge at the Velddrif transfer station so waste transferred from this facility to the landfill was obtained. The weighbridge will reportedly be operational from the end of November 2018. The data obtained from the operational weighbridge at the Piketberg Transfer Station was used.

Aquila Environmental was appointed as sub-consultant and conducted the hazardous waste study throughout the Bergrivier Municipal area as well as the general waste characterisation study. Information was acquired as explained under 1.3 above.

### 3.3.3 General Waste Characterisation

A waste characterisation study of the Bergrivier general waste stream was undertaken by Aquila Environmental. It took place over a two week period, from Monday 30 July to Friday 3 August 2018 in Piketberg, and Monday 13 August to Friday 17 August 2018 in Velddrif.

Bergrivier Municipality supplied Aquila Environmental with the various areas within its jurisdiction that needed to be characterised, as well as with the approximate amount of households in each. This information made it possible for the researchers to determine the ideal sampling size to be collected from each area. Bergrivier Municipality further indicated that both clear and black bags needed to be characterised for each area.

The sampling size was determined by making use of the following graph supplied by the Environmental Protection Agency (EPA, 1996) for areas with less than 4000 households:

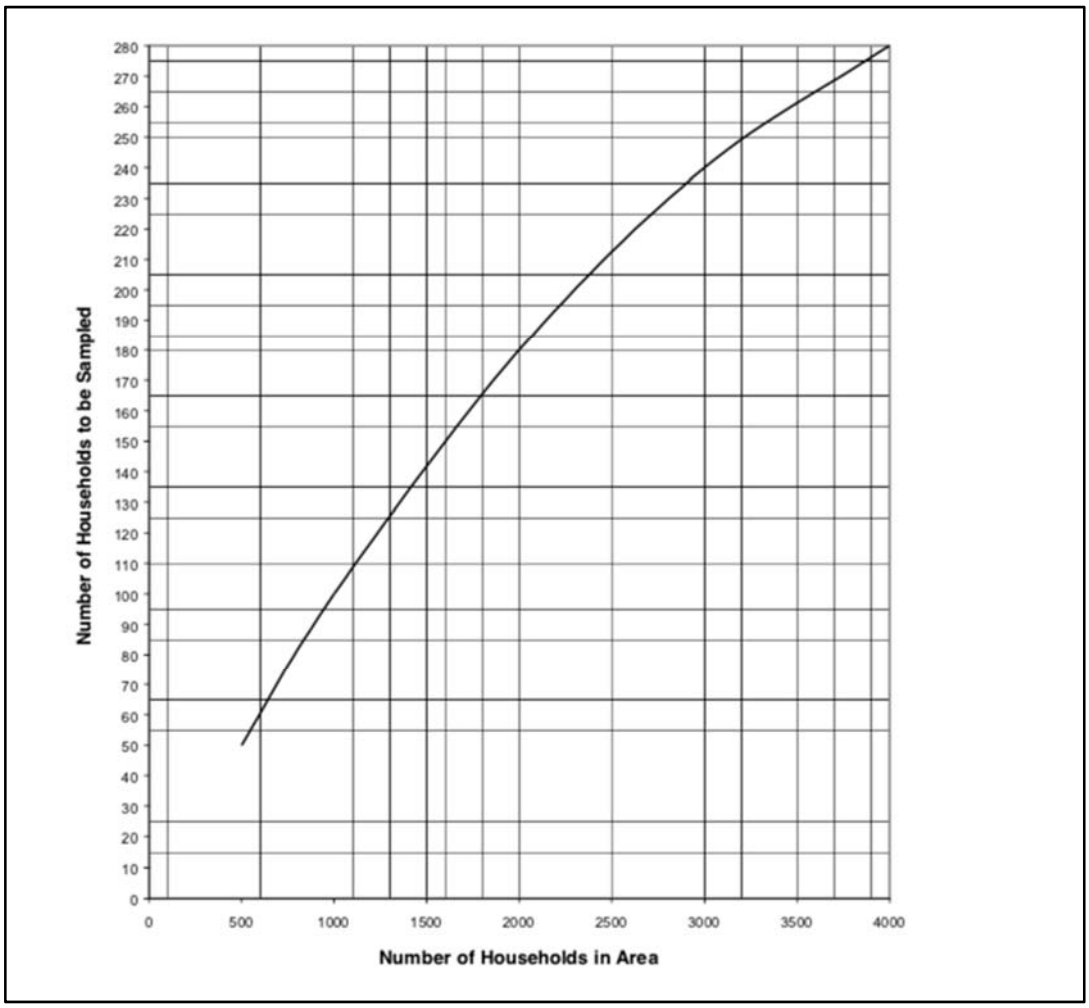



**Figure 3.5: EPA Graph for Estimating Sampling Size for areas with less than 4,000 households**

### 3.3.3.1 Waste Categories

Sampled waste was sorted in the following categories identified prior to the study and in accordance with the DEADP guidelines.

| Waste stream | Detailed information of waste stream | WIS classification |
|---|---|---|
| 1. Plastic Film | • LDPE<br>• LLDPE<br>• This includes non-recyclable soft plastics like chips and chocolate wrappers | GW51.03<br>GW51.06 |
| 2. Dense Plastics | • PVC<br>• HDPE<br>• PP<br>• PET<br>• Video/CD/DVD cases | GW52.02<br>GW51.06<br>GW52.04<br>GW52.01<br>GW51.06 |
| 3. Polystyrene (Foamalite) | • PS (Extruded Polystyrene (EPS) only) | GW52.05 |
| 4. Paper and Cardboard | • Office Paper<br>• Newspaper<br>• Magazines<br>• Phonebooks<br>• Books & Booklets<br>• Tissue Paper<br>• Photo Paper<br>• Paper plates and cups<br>• Cards | GW50 |

| Waste stream | Detailed information of waste stream | WIS classification |
|---|---|---|
| | • Envelopes<br>• Receipts<br>• Wrapping paper<br>• Non-recyclable/Badly soiled paper<br>• Paper/cardboard packaging<br>• Cardboard (K4) (corrugated and non-corrugated)<br>• Tetrapak<br>• Egg cartonnes | |
| 5. Metals (ferrous and non-ferrous) | • Aluminium packaging eg. foil<br>• Steel cans (eg. canned food tins)<br>• Aluminium cans (eg. certain cooldrink cans)<br>• Scrap metal (eg. steel offcuts)<br>• Pieces of copper (will not separate copper contained in e-waste)<br>• All aerosol cans<br>• Pill sleeves if all metal | GW53 |
| 6. Glass | • Glass bottles (e.g. alcohol/drink bottles; all colours)<br>• Table and kitchenware<br>• Other/special glass (windowpanes etc) | GW52 |
| 7. Food Waste | • All kitchen waste – vegetable and animal derived | GW20.02 |
| 8. Medical Waste / Healthcare Waste | • Human hygiene waste (nappies, condoms, sanitary items, tissues, wet wipes, colostomy bags, earbuds etc.).<br>• Health Care Risk Waste (e.g. sharps, gloves)<br>• Hair (synthetic and/or natural)<br>• Animal carcases<br>• Animal faeces | GW99 |
| 9. Garden Waste | • All garden waste (incl. soil, plant material, woody plant material, hay, flower bouquets, grass etc.)<br>• Wood waste | GW20.01 and GW20.03 |
| 10. E-Waste and Household Hazardous Waste | • Batteries (automotive, rechargeable, single use etc.)<br>• Large and small household appliances<br>• IT and telecommunications equipment<br>• Lighting equipment (light bulbs etc.)<br>• Electric and Electronic Tools<br>• Electrical toys (e.g. battery operated)<br>• Medical devices (e.g. monitoring equipment)<br>• Monitoring and control instruments (e.g. thermometers, conductivity meters etc.)<br>• Automatic dispensers (e.g. sanitiser)<br>• Ink and tonneer cartridges<br>• Paints and pesticides (only if container is not empty)<br>• Gas bottles<br>• Lighters | GW18 |

| Waste stream | Detailed information of waste stream | WIS classification |
|---|---|---|
| 11. Others | • Crockery/ceramics<br>• Vacuum cleaner inners<br>• Fines<br>• Ash<br>• Cat litter<br>• Textiles, rubber, leather<br>• Clothing and shoes<br>• Orange and onion bags<br>• CD's/DVD's<br>• Cigarette butts<br>• Toothpaste tubes (excluding cap)<br>• "Papsak"<br>• Pill sleeves with plastic and foil combination<br>• Bars of soap<br>• Maize meal bags<br>• Jewellery<br>• Hardboard | GW99 |

#### 3.3.3.2 Sampling

Using the graph in **Figure 3.5** a sampling size was determined for each area and the following table indicates the planned sampling and sorting versus the actual sampling and sorting at the Piketberg and Velddrif Refuse Transfer Station.

**Table 3.6: Planned vs Actual Sorting Bags**

| Piketberg RTS | Black bags to be collected and sorted | Black bags actually collected and sorted | Clear bags to be collected and sorted | Clear bags actually collected and sorted | Total to be collected and sorted | Total actually collected and sorted |
|---|---|---|---|---|---|---|
| Piketberg Ward 4 | 130 | 65 | 130 | 120 | **260** | **185** |
| Eendekuil | 50 | 62 | 0 | 0 | **50** | **62** |
| Redelinghuys | 50 | 51 | 0 | 0 | **50** | **51** |
| Piketberg Ward 3 | 80 | 61 | 80 | 66 | **160** | **127** |
| Porterville | 165 | 165 | 165 | 116 | **330** | **281** |
| **TOTAL** | **475** | **404** | **375** | **302** | **850** | **706** |
| **Velddrif RTS** | | | | | | |
| Dwarskersbos | 60 | 0 | 60 | 26 | **120** | **26** |
| Port Owen | 60 | 57 | 60 | 43 | **120** | **100** |
| Aurora | 50 | 53 | 50 | 46 | **100** | **99** |
| Noordhoek | 130 | 138 | 130 | 133 | **260** | **271** |
| Laaiplek | 80 | 0 | 80 | 49 | **160** | **49** |
| Velddrif | 115 | 119 | 115 | 124 | **230** | **243** |
| **TOTAL** | **495** | **367** | **495** | **421** | **990** | **788** |

### 3.3.3.3 Results

The tables and charts on the following pages provide a breakdown of the results from the waste characterisation studies undertaken at the Piketberg and Velddrif transfer stations. The information is provided for the black bag waste, the clear bag waste and a total of the combined waste stream, broken down into the categories discussed.

**Table 3.7: Black Bag Waste Characterisation Results**

| CHARACTERISATION RESULTS PER SAMPLED AREA - BLACK BAG WASTE | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOWN/ SETTLEMENT | NO. OF BLACK BAGS SAMPLED | PLASTIC FILM | DENSE PLASTIC | POLYSTYRENE | PAPER / CARD BOARD | METALS | GLASS | FOOD WASTE | MEDICAL / HEALTH-CARE | GARDEN | E-WASTE / HOUSEHOLD HAZARDOUS | OTHER | TOTAL |
| | | kg | kg | kg | kg | kg | kg | kg | kg | kg | kg | kg | kg |
| **Piketberg Ward 3** | 61 | 21.79 | 14.54 | 2.17 | 24.94 | 5.25 | 25.81 | 109.82 | 20.66 | 3.66 | 0.50 | 19.34 | **248.48** |
| **Piketberg Ward 4** | 65 | 30.17 | 18.53 | 5.47 | 51.44 | 9.77 | 33.07 | 137.17 | 52.87 | 27.20 | 2.89 | 31.13 | **399.72** |
| **Eendekuil** | 62 | 21.15 | 15.07 | 2.33 | 31.57 | 10.51 | 28.00 | 107.49 | 33.74 | 16.30 | 0.27 | 28.71 | **295.14** |
| **Redelinghuys** | 51 | 16.53 | 15.59 | 1.45 | 24.48 | 11.34 | 30.88 | 78.15 | 27.99 | 7.23 | 4.25 | 25.58 | **243.46** |
| **Porterville** | 165 | 60.92 | 43.48 | 3.45 | 122.46 | 18.30 | 60.31 | 182.58 | 97.85 | 21.98 | 4.92 | 73.92 | **690.18** |
| **Dwarskersbos*** | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **0.00** |
| **Port Owen** | 57 | 12.92 | 10.62 | 1.33 | 16.62 | 2.67 | 36.61 | 62.95 | 12.86 | 5.96 | 3.10 | 22.42 | **188.08** |
| **Aurora** | 53 | 23.44 | 12.10 | 2.78 | 27.63 | 7.70 | 22.57 | 89.61 | 48.80 | 9.60 | 3.90 | 30.22 | **278.36** |
| **Noordhoek** | 138 | 55.65 | 42.51 | 7.77 | 91.08 | 16.79 | 68.81 | 183.82 | 61.46 | 29.59 | 2.29 | 38.78 | **598.55** |
| **Laaiplek*** | 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **0.00** |
| **Velddrif** | 119 | 42.30 | 44.86 | 6.13 | 71.60 | 16.02 | 62.65 | 113.19 | 41.86 | 15.07 | 2.12 | 54.03 | **469.83** |
| **TOTALS** | **771** | **284.88** | **217.30** | **32.89** | **461.80** | **98.35** | **368.72** | **1064.78** | **398.09** | **136.60** | **24.26** | **324.12** | **3 411.79** |

* Bags were taken for disposal before sampling could be done

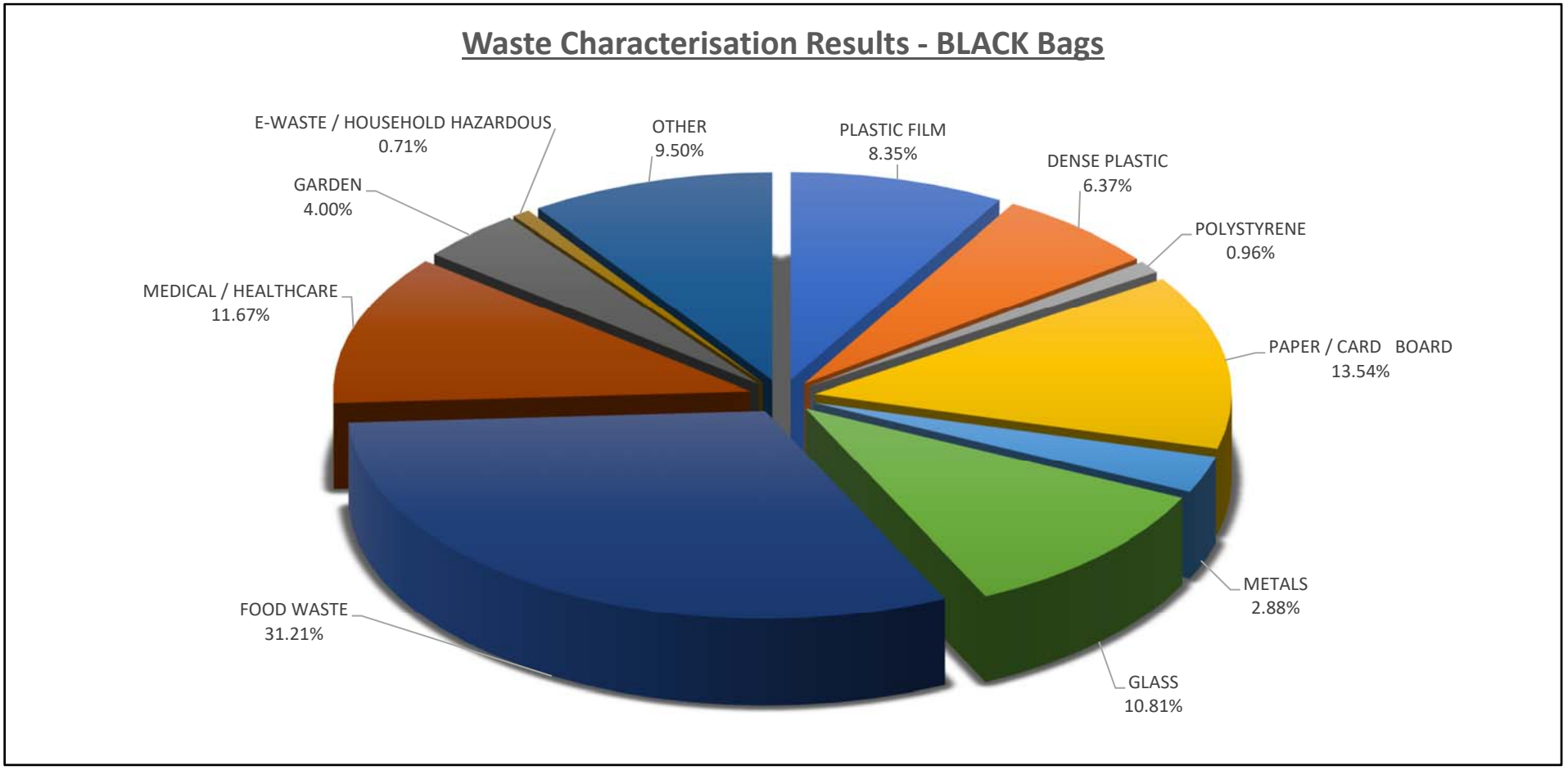



**Figure 3.6: Black Bag Waste Characterisation Results**

**Table 3.8: Clear Bag Waste Characterisation Results**

| CHARACTERISATION RESULTS PER SAMPLED AREA - CLEAR BAG WASTE | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOWN/ SETTLEMENT | NO. OF CLEAR BAGS SAMPLED | PLASTIC FILM | DENSE PLASTIC | POLYSTYRENE | PAPER / CARD BOARD | METALS | GLASS | FOOD WASTE | MEDICAL / HEALTHCARE | GARDEN | E-WASTE / HOUSEHOLD HAZARDOUS | OTHER | TOTAL |
| | | kg | kg | kg | kg | kg | kg | kg | kg | kg | kg | kg | kg |
| **Piketberg Ward 3** | **66** | 12.48 | 21.02 | 1.76 | 43.99 | 6.53 | 36.15 | 6.34 | 6.84 | 1.30 | 5.96 | 7.47 | **149.85** |
| **Piketberg Ward 4** | **120** | 25.58 | 46.27 | 4.61 | 73.25 | 15.35 | 78.76 | 16.51 | 6.47 | 6.24 | 3.06 | 14.35 | **290.44** |
| **Eendekuil** | **0** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **0.00** |
| **Redelinghuys** | **0** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **0.00** |
| **Porterville** | **116** | 25.88 | 48.55 | 3.21 | 85.33 | 13.20 | 62.02 | 8.86 | 5.46 | 0.27 | 5.59 | 17.60 | **275.97** |
| **Dwarskersbos** | **26** | 8.57 | 7.56 | 0.72 | 18.42 | 2.34 | 30.01 | 3.05 | 2.23 | 0.01 | 0.06 | 3.50 | **76.48** |
| **Port Owen** | **43** | 8.10 | 9.77 | 0.81 | 25.40 | 4.28 | 55.38 | 9.06 | 2.16 | 0.28 | 0.76 | 4.70 | **120.70** |
| **Aurora** | **46** | 15.75 | 15.16 | 4.17 | 28.50 | 8.18 | 23.96 | 24.90 | 4.46 | 2.49 | 2.70 | 16.28 | **146.55** |
| **Noordhoek** | **133** | 45.44 | 44.30 | 4.24 | 83.92 | 13.08 | 154.92 | 85.47 | 37.66 | 7.16 | 2.37 | 58.73 | **537.29** |
| **Laaiplek** | **49** | 15.22 | 14.23 | 2.15 | 37.23 | 7.17 | 75.88 | 31.37 | 10.98 | 1.36 | 1.32 | 9.49 | **206.39** |
| **Velddrif** | **124** | 28.00 | 44.30 | 4.13 | 104.33 | 15.77 | 97.95 | 18.99 | 4.41 | 3.74 | 4.15 | 21.84 | **347.61** |
| **TOTALS** | **723** | **185.02** | **251.17** | **25.79** | **500.35** | **85.90** | **615.03** | **204.57** | **80.68** | **22.84** | **25.99** | **153.95** | **2 151.29** |

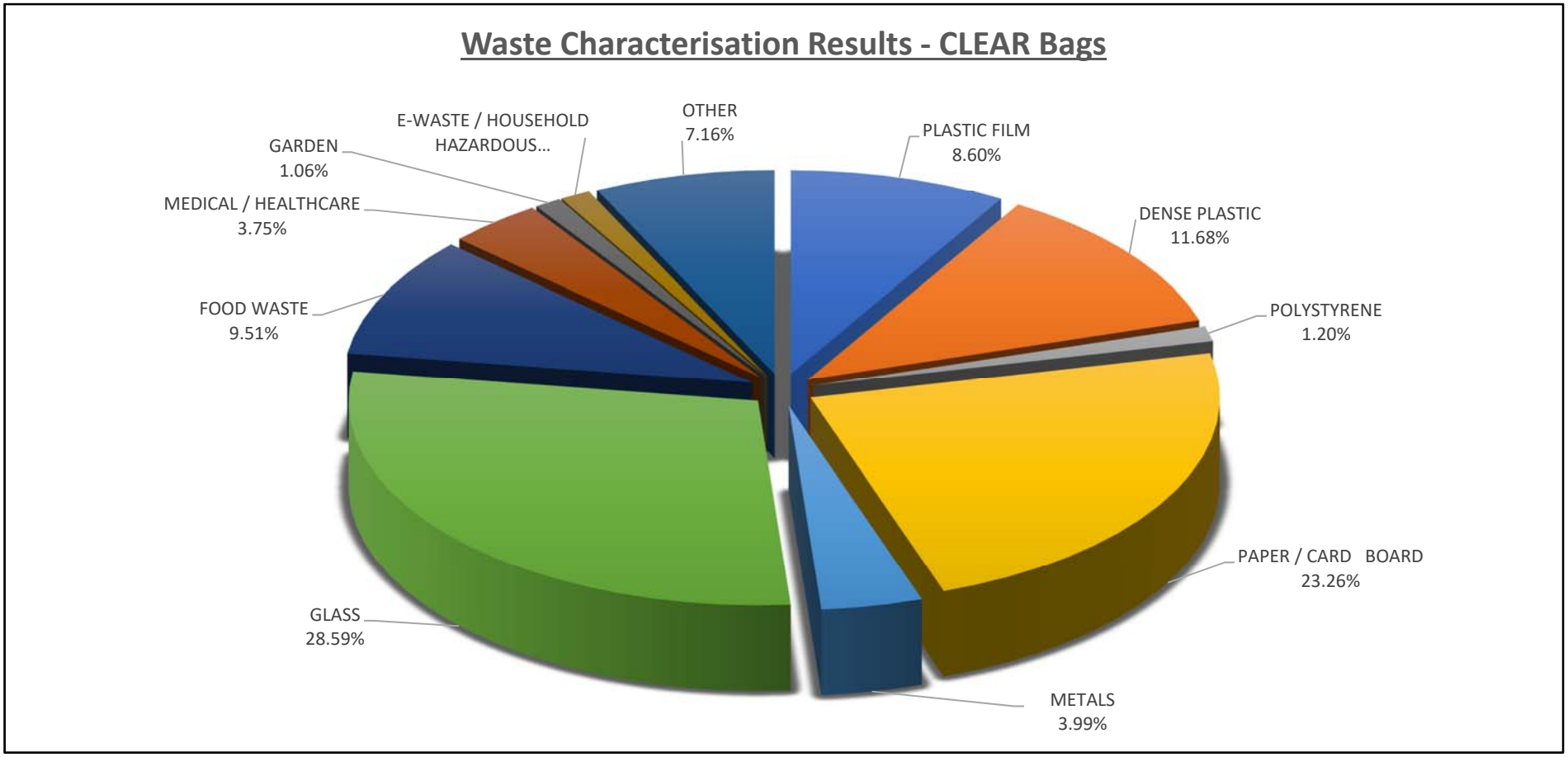



**Figure 3.7: Clear Bag Waste Characterisation Results**

**Table 3.9: Total Waste Characterisation Results**

| CHARACTERISATION RESULTS PER SAMPLED AREA - TOTAL WASTE (Black plus Clear Bags) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOWN/ SETTLEMENT | NO. OF TOTAL BAGS SAMPLED | PLASTIC FILM | DENSE PLASTIC | POLYSTYRENE | PAPER / CARD BOARD | METALS | GLASS | FOOD WASTE | MEDICAL / HEALTHCARE | GARDEN | E-WASTE / HOUSEHOLD HAZARDOUS | OTHER | TOTAL |
| | | kg | kg | kg | kg | kg | kg | kg | kg | kg | kg | kg | kg |
| **Piketberg Ward 3** | **127** | 34.27 | 35.56 | 3.93 | 68.92 | 11.78 | 61.97 | 116.16 | 27.50 | 4.96 | 6.46 | 26.81 | **398.32** |
| **Piketberg Ward 4** | **185** | 55.75 | 64.80 | 10.09 | 124.69 | 25.12 | 111.83 | 153.68 | 59.35 | 33.44 | 5.95 | 45.47 | **690.16** |
| **Eendekuil** | **62** | 21.15 | 15.07 | 2.33 | 31.57 | 10.51 | 28.00 | 107.49 | 33.74 | 16.30 | 0.27 | 28.71 | **295.14** |
| **Redelinghuys** | **51** | 16.53 | 15.59 | 1.45 | 24.48 | 11.34 | 30.88 | 78.15 | 27.99 | 7.23 | 4.25 | 25.58 | **243.46** |
| **Porterville** | **281** | 86.80 | 92.04 | 6.66 | 207.78 | 31.49 | 122.34 | 191.44 | 103.31 | 22.25 | 10.51 | 91.52 | **966.15** |
| **Dwarskersbos** | **26** | 8.57 | 7.56 | 0.72 | 18.42 | 2.34 | 30.01 | 3.05 | 2.23 | 0.01 | 0.06 | 3.50 | **76.48** |
| **Port Owen** | **100** | 21.03 | 20.39 | 2.14 | 42.01 | 6.95 | 91.99 | 72.02 | 15.02 | 6.24 | 3.87 | 27.12 | **308.78** |
| **Aurora** | **99** | 39.19 | 27.27 | 6.95 | 56.13 | 15.89 | 46.53 | 114.51 | 53.26 | 12.09 | 6.61 | 46.50 | **424.92** |
| **Noordhoek** | **271** | 101.09 | 86.80 | 12.01 | 175.00 | 29.88 | 223.73 | 269.30 | 99.12 | 36.75 | 4.66 | 97.51 | **1 135.85** |
| **Laaiplek** | **49** | 15.22 | 14.23 | 2.15 | 37.23 | 7.17 | 75.88 | 31.37 | 10.98 | 1.36 | 1.32 | 9.49 | **206.39** |
| **Velddrif** | **243** | 70.30 | 89.16 | 10.25 | 175.93 | 31.79 | 160.59 | 132.18 | 46.27 | 18.81 | 6.27 | 75.87 | **817.44** |
| **TOTALS** | **1494** | **469.90** | **468.48** | **58.68** | **962.16** | **184.25** | **983.74** | **1269.35** | **478.77** | **159.44** | **50.24** | **478.07** | **5 563.08** |

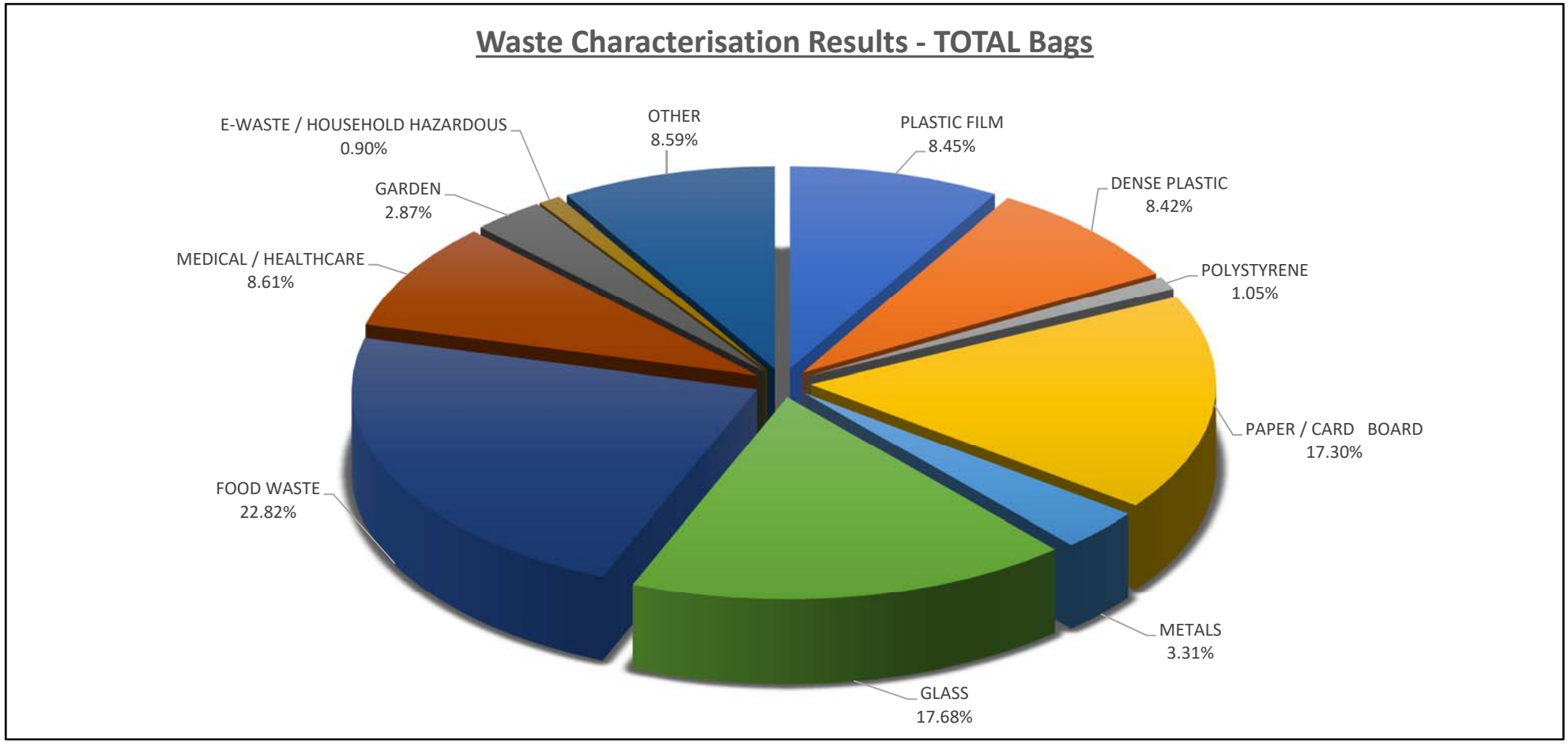



**Figure 3.8: Total Waste Characterisation Results**

#### 3.3.3.4 Waste Characterisation Study Observations

During the first day of characterisation it was found that Expanded Polystyrene (EPS) makes up a significant portion of the hard plastics waste stream. As of the second day of characterisation there was a separate stream dedicated to this waste stream specifically. There was very little garden waste to be found in the domestic waste stream sampled during the study. The garden waste that was found consisted of mostly leaves and flowers thus indicating that the separate collection of garden waste is taking place. The heaviest component of the "others" category was ash or clothing and shoes.

There seems to be a widespread misuse of clear bags meant for recycling. Based on the results of the study the clear bags are apparently also used as black bags in most areas. The reason for this could be as a result of general public awareness on the recyclability of certain waste streams, but it could also be because of the bag allocation given to the public. To promote recycling each household is given only one black bag per week but unlimited clear bags. It does thus sometimes happen that the clear bags are used as black bags when the black bag is full. This matter needs to be addressed through additional public awareness and education campaigns.

### 3.3.4 General Waste quantities

As indicated the Bergrivier Municipality do not make use of internal landfill sites for disposal. The waste from Bergrivier gets sent to either the Velddrif or Piketberg transfer stations from where it is taken to Vredenburg (from Velddrif) and Malmesbury (from Piketberg) landfills. The waste quantities in **Table 3.10** were provided by the landfills.

**Table 3.10: Disposal quantities as reported by landfills**

| YEAR | Tonnes from Velddrif RTS to Vredenburg LF | | Tonnes from Piketberg RTS to Malmesbury LF | | Total for the Municipality | |
|---|---|---|---|---|---|---|
| | Annual | Monthly | Annual | Monthly | Annual | Monthly |
| 2015 | 2 532 | 211 | 3 880 | 323 | 6 412 | 534 |
| 2016 | 2 836 | 236 | 4 269 | 356 | 7 105 | 592 |
| 2017 | 2 587 | 216 | 4 186 | 349 | 6 773 | 564 |
| 2018 | 2 753 | 229 | 3 934 | 328 | 6 687 | 557 |

The above information indicates an average total annual disposal rate over the last four years of about 6,745 tonnes and an average monthly disposal rate of close to 562 tonnes. These values only include waste from residents that receive a waste collection service and thus excludes the large rural population of the municipality. These are the numbers recorded at the landfills and thus also excludes the waste that gets removed from the waste stream for through recycling.

Note that the quantities above do not include builder's rubble, garden waste nor rural area waste. Builder's rubble quantities fluctuate monthly and is not dependent on population waste generation, but rather economy related. The average density of loads in the above recorded tonnages is reportedly approximately 180kg/$m^3$, which shows that little to no builder's rubble is transported from the transfer stations for disposal. Builder's rubble is offloaded at the closed disposal sites for use as capping material, or taken to the transfer stations in Bergrivier.
Information from the transfer stations indicates that the Velddrif RTS receives in the order of 312tonnes of builder's rubble per month (3,744tonnes annually) and the Piketberg landfill receives in the order of 166 tonnes per month (2,000 tonnes annually). Builder's rubble is accumulating at the Velddrif transfer station and needs to be removed since the facility is not licensed as a landfill. With the builder's rubble and garden waste not removed from the facility, the transfer station is operating under noncompliance with its waste license and this matter needs to be addressed.

The totals in **Table 3.10** do not include the recycled tonnages, as only the disposed portion of the waste stream is weighed at the landfills. The recycled fraction is currently estimated at 7% of the generated waste stream (Bergrivier 2016/17 Annual Report). Garden waste is also not included in the recorded totals as it is chipped and distributed to farmers or stored at the waste management facilities. The Municipality have estimates of builder's rubble and garden waste offloaded at the transfer stations, landfills and drop-offs. This information was converted to annual tonnages and shown in **Table 3.11**.

**Table 3.11: Garden waste and Builders Rubble Annual Tonnages**

| | Builders Rubble | Garden Waste |
|---|---|---|
| Velddrif | 3,744.00 | 1,721.16 |
| Piketberg | 1,995.38 | 681.30 |
| Porterville | 302.40 | 665.13 |
| **Total** | **6,041.78** | **3,067.59** |

If garden waste from **Table 3.11** and the recycling from **Figure 3.10** and **Figure 3.11** are added to the disposed tonnages from **Table 3.10** it results in an annual waste stream of 10,412 tonnes which is comparable to the estimated waste generation volumes given in **Table 3.12.** This is especially true when considering the tonnages in the generation estimates do not take into account the waste from rural areas, and some rural area waste (estimated at about 5%) does make it way to the town facilities.

Waste generation rates of 0.4kg per person per day was used for low income groups, 0.7kg per person per day for middle income groups and 1.0kg per person per day for high income groups. These are in line with findings from the DEA 2006 State of the Environmental Report. Using the available data from the population and income group statistics above, the estimated current and future quantities of waste for the Bergrivier Municipality, excluding rural areas, was calculated as per **Table 3.12** below:

**Table 3.12: Current and Projected Waste Quantities for Bergrivier**

| Sub-area | Population (2018) | Waste Generated in Tonnes/year (2018) | Population (2019) | Waste Generated in Tonnes/year (2019) | Population (2020) | Waste Generated in Tonnes/year (2020) | Population (2021) | Waste Generated in Tonnes/ year (2021) | Population (2022) | Waste Generated in Tonnes/ year (2022) | Average Waste Generation Factor for Area in kg/p/d |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Redelinghuys SP | 636 | 139 | 645 | 141 | 655 | 143 | 664 | 145 | 674 | 147 | 0.60 |
| Great Winterhoek Forest Reserve | 119 | 39 | 121 | 40 | 123 | 40 | 125 | 41 | 126 | 41 | 0.90 |
| Eendekuil SP | 1 690 | 412 | 1 714 | 418 | 1 739 | 424 | 1 764 | 430 | 1 789 | 436 | 0.67 |
| Dwarskersbos SP | 739 | 194 | 750 | 197 | 760 | 200 | 771 | 203 | 782 | 205 | 0.72 |
| Aurora SP | 636 | 143 | 645 | 145 | 655 | 147 | 664 | 150 | 674 | 152 | 0.62 |
| Noordhoek | 7 885 | 1 665 | 7 998 | 1 689 | 8 112 | 1 713 | 8 229 | 1 738 | 8 346 | 1 763 | 0.58 |
| Laaiplek | 640 | 171 | 649 | 173 | 658 | 176 | 667 | 178 | 677 | 181 | 0.73 |
| Velddrif SP | 2 341 | 606 | 2 374 | 615 | 2 408 | 624 | 2 443 | 633 | 2 478 | 642 | 0.71 |
| Admiral Island and Port Owen Estates | 1 302 | 383 | 1 321 | 388 | 1 340 | 394 | 1 359 | 399 | 1 379 | 405 | 0.81 |
| Goedverwacht SP | 2 188 | 507 | 2 220 | 514 | 2 251 | 521 | 2 284 | 529 | 2 316 | 536 | 0.63 |
| Beaverlac Nature Reserve | 66 | 12 | 67 | 13 | 68 | 13 | 69 | 13 | 70 | 13 | 0.51 |
| Piketberg SP | 13 335 | 3 440 | 13 526 | 3 489 | 13 720 | 3 539 | 13 916 | 3 590 | 14 116 | 3 641 | 0.71 |
| De Hoek Mine | 365 | 115 | 370 | 117 | 375 | 118 | 380 | 120 | 386 | 122 | 0.86 |
| Wittewater SP | 941 | 226 | 955 | 229 | 968 | 233 | 982 | 236 | 996 | 239 | 0.66 |
| Porterville SP | 7 796 | 1 963 | 7 907 | 1 991 | 8 020 | 2 020 | 8 135 | 2 049 | 8 252 | 2 078 | 0.69 |
| Voorberg Correctional Services | 751 | 273 | 762 | 277 | 773 | 281 | 784 | 285 | 795 | 289 | 1.00 |
| **Total** | **41 431** | **10 289** | **42 024** | **10 437** | **42 626** | **10 586** | **43 237** | **10 738** | **43 856** | **10 892** | **0.68** |

### 3.3.5 Hazardous waste

In terms of Chapter 2, Condition 4: Waste Classification of the Waste Classification and Management Regulations, SANS 10234 must be used. SANS 10234 is the South African National Standard Globally Harmonised System [GHS], for The Classification and Labelling of Chemicals and must be used by the generator prior to August 2016. It thus is a NEMWA requirement to classify the hazardous waste as per SANS 10234, based on the nature of its physical, health and environmental hazardous properties (hazard classes); and the degree of severity of hazard posed (hazard categories).

HCRW requires no special classification in terms of SANS 10234. It is pre-classified as 2b (iii). Refer to NEMWA (Regulation 634: Chapter 7: Annexure A of) stating that waste specified in condition 2 of the Annexure, does not require classification in terms of Regulation 4(1) or Assessment in Regulation 8 (a)(1). Condition 2b, Hazardous Waste: 2b (i) Hazardous waste, asbestos waste and 2b (iii) other: Health Care Risk Waste.

Importantly, if a particular chemical substance in a waste is not listed with corresponding thresholds limits in section 6 of the Norms and Standards, and the waste has been classified as hazardous in terms of SANS 10234, the waste must be considered a Type 1 waste, and the Department of Water Affairs must be informed within 30 days of the particular element or chemical substance being identified.

Very few generators in the Bergrivier Area have the waste classified per SANS 10234. Because the SANS 10234 classification was not used by the generators of hazardous waste, it poses a challenge to the consultants as the IWMP format should include hazardous waste generated per SANS 10234 requirements. The hazardous waste survey conducted by Aquila Environmental is described in this section with a full copy of the survey attached as **Annexure C**.

#### 3.3.5.1 Background and Methodology

The method of final disposal must be determined as it is indicative of the impact of such hazardous waste on the environment. Also, the hazardous waste's nature was determined as hazardous by observing the treatment and final Disposal at a H:h or H:H landfill, now referred to as Class A landfill.

The Regulation 635 in NEMWA for unclassified hazardous substances within waste is:

*" If a particular chemical substance in a waste is not listed with corresponding thresholds limits in section 6 of the Norms and Standards, and the waste has been classified as hazardous in terms of SANS 10234, the waste must be considered a Type 1 waste or chemical substance being identified within 30 days"*

If it is assumed that unclassified hazardous waste will be hazardous Type 1 waste, even if one particular chemical substance is not analysed and confirmed as hazardous according to Schedule 3: Defined Waste AND even if it constituent is not the most hazardous substance in the composition of hazardous chemicals, then all of our hazardous waste will Type 1. Thus all waste will be high hazard waste that must have a final disposal in a Class A landfill, and we cannot apply this deduction. The Minimum Requirements, 1998 under ECA, provides a table for definition of hazardous waste per generator per industry. This Table was adapted and now forms the basis of the industrial sources for classified waste in Schedule 3 of NEMWA.

The industries identified are broadly defined as the following in this study based on Schedule 3 of NEMWA. Industrial Groups indicated by "NO" in column 3 of **Table 3.13** below are not present in the Bergrivier Municipal Area and were therefore omitted from the rest of the study for conciseness.

**Table 3.13: Hazardous Waste Industries (NEMWA Schedule 3)**

| Industrial Group | Industrial Process | Potential generator identified in study area? | Hazardous waste actually generated at potential generator? |
|---|---|---|---|
| **1. Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing** | (a) hazardous portion of wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing | YES | YES |
| **2. Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard** | (a) hazardous portion of wastes from wood processing and the production of panels and furniture<br>(b) hazardous portion of wastes from wood preservation<br>(c) hazardous portion of wastes from pulp, paper and cardboard production and processing | YES | NO |
| **3. Wastes from the leather, fur and textile industries** | (a) hazardous portion of wastes from the leather and fur industry<br>(b) hazardous portion of wastes from the textile industry | YES | NO |
| **4. Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal** | (a) wastes from petroleum refining<br>(b) wastes from the pyrolytic treatment of coal<br>(c) wastes from natural gas purification and transportation | NO | N/A |
| **5. Wastes from inorganic chemical processes** | (a) wastes from the manufacture, formulation, supply and use (MFSU) of acids<br>(b) wastes from the MFSU of bases<br>(c) wastes from the MFSU of salts and their solutions and metallic oxides<br>(d) metal-containing wastes<br>(e) wastes from the MFSU of sulphur chemicals, sulphur chemical processes and desulphurisation processes<br>(f) wastes from the MFSU of halogens and halogen chemical processes<br>(g) wastes from the MFSU of silicon and silicon derivatives<br>(h) wastes from the MSFU of phosphorous chemicals and phosphorous chemical processes<br>(i) wastes from the MFSU of nitrogen chemicals, nitrogen chemical processes and fertiliser manufacture<br>(j) wastes from the manufacture of inorganic pigments<br>(k) other wastes from inorganic chemical processes | YES | NO |

| Industrial Group | Industrial Process | Potential generator identified in study area? | Hazardous waste actually generated at potential generator? |
|---|---|---|---|
| **6. Wastes from organic chemical processes** | (a) wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals<br>(b) wastes from the MFSU of plastics, synthetic rubber and man-made fibres<br>(c) wastes from the MFSU of organic dyes and pigments<br>(d) wastes from the MFSU of organic plant protection products, wood preserving agents and other biocides<br>(e) wastes from the MFSU of pharmaceuticals<br>(f) wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics<br>(g) other wastes from the MFSU of fine chemicals and chemical products | NO | N/A |
| **7. Wastes from thermal processes** | (a) hazardous portion of wastes from power stations and other combustion plants<br>(b) hazardous portion of wastes from the iron and steel industry<br>(c) wastes from aluminium thermal metallurgy<br>(d) wastes from lead thermal metallurgy<br>(e) wastes from zinc thermal metallurgy<br>(f) wastes from copper thermal metallurgy<br>(g) wastes from silver, gold and platinum thermal metallurgy<br>(h) wastes from other non-ferrous thermal metallurgy<br>(i) hazardous portion of wastes from casting of ferrous pieces<br>(j) hazardous portion of wastes from casting of non-ferrous pieces<br>(k) hazardous portion of wastes from manufacture of glass and glass products<br>(l) hazardous portion of wastes from manufacture of ceramic goods, bricks, tiles and construction products<br>(m) hazardous portion of wastes from manufacture of cement, lime and plaster and articles and products made from them | YES | YES |
| **8. Waste from the photographic industry** | (a) hazardous portion of waste from the photo- graphic industry | NO | N/A |

| Industrial Group | Industrial Process | Potential generator identified in study area? | Hazardous waste actually generated at potential generator? |
|---|---|---|---|
| **9. Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks** | (a) wastes from MFSU and removal of paint and varnish<br>(b) wastes from MFSU of other coatings (including ceramic materials)<br>(c) wastes from MFSU of printing inks<br>(d) wastes from MFSU of adhesives and sealants (including waterproofing products) | YES | NO |
| **10. Wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydrometallurgy** | (a) wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising)<br>(b) wastes from non-ferrous hydrometallurgical processes<br>(c) wastes from sludges and solids from tempering processes<br>(d) wastes from hot galvanising processes | NO | N/A |
| **11. Wastes from shaping and physical and mechanical sur-face treatment of metals and plastics** | (a) hazardous portion of wastes from shaping and physical and mechanical surface treatment of metals and plastics<br>(b) wastes from water and steam degreasing processes | YES | YES |
| **12. Oil wastes and wastes of liquid fuels (except edible oils)** | (a) waste hydraulic oils<br>(b) waste engine, gear and lubricating oils<br>(c) waste insulating and heat transmission oils<br>(d) oil/water separator contents<br>(e) wastes of liquid fuels<br>(f) hazardous portion of other oil waste | YES | YES |
| **13. Waste organic solvents, refrigerants and propellants** | (a) waste organic solvents, refrigerants and foam/aerosol propellants | NO | N/A |

| Industrial Group | Industrial Process | Potential generator identified in study area? | Hazardous waste actually generated at potential generator? |
|---|---|---|---|
| **14. Other wastes not specified in the list** | (a) hazardous portion of wastes from end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance<br>(b) hazardous portion of wastes from electrical and electronic equipment<br>(c) hazardous portion of wastes from off-specification batches and unused products<br>(d) wastes from discarded gases in pressure containers and discarded chemicals<br>(e) wastes from discarded batteries and accumulators<br>(f) wastes from transport tank, storage tank and barrel cleaning<br>(g) spent catalysts wastes<br>(h) oxidising substances wastes<br>(i) aqueous liquid wastes destined for off-site treatment<br>(j) waste linings and refractories | YES | NO |
| **15. Construction wastes** | (a) wastes from bituminous mixtures, coal tar and tarred products<br>(b) discarded metals (including their alloys)<br>(c) waste soil (including excavated soil from contaminated sites), stonnees and dredging spoil<br>(d) wastes from insulation materials and asbestos-containing construction materials<br>(e) wastes from gypsum-based construction material<br>(f) wastes from other construction and demolition **[wastes]** | YES | YES |
| **16. Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)** | (a) wastes from natal care, diagnosis, treatment<br>(b) wastes from research, diagnosis, treatment or prevention of disease in humans prevention of disease involving animals | YES | YES |

| Industrial Group | Industrial Process | Potential generator identified in study area? | Hazardous waste actually generated at potential generator? |
|---|---|---|---|
| **17. Wastes from waste management facilities** | (a) hazardous portion of wastes from incineration or pyrolysis of waste<br>(b) hazardous portion of wastes from physico/ chemical treatments of waste<br>(c) hazardous portion of stabilised/solidified wastes<br>(d) hazardous portion of wastes from aerobic treatment of solid wastes<br>(e) hazardous portion of wastes from anaerobic treatment of waste<br>(f) landfill leachate wastes<br>(g) wastes from shredding of metal-containing wastes<br>(h) wastes from oil regeneration<br>(i) wastes from soil remediation | NO | N/A |

Based on physical and chemical characteristics hazardous waste can be grouped according to the South African National Standards 10228/9 (SANS – 0228/9) into the following classes:

| Hazardous Waste Class (SANS - 0228/9) | |
|---|---|
| **Classes** | **Description** |
| 1 | Explosives |
| 2 | Gases |
| 3 | Flammable Liquid |
| 4 | Flammable Solids/Substances |
| 5 | Oxidising Substances |
| 6 | Poisonous and Infectious Substances |
| 7 | Radioactive Substances |
| 8 | Corrosive Substances |
| 9 | Miscellaneous Substances |

### 3.3.5.2 Waste Types and Characteristics

Aquila Environmental's scope included the identification of industrial waste, hazardous waste and health care risk waste generators as well as acquiring the available information of these waste types from the generators such as the volumes generated, treatment methods, transport methods, transporters and final disposal.

A limited amount of Hazardous Waste is generated within the Bergrivier Municipal Area. The Agriculture Industry (Industrial Group 1), Construction Waste (specifically, Industrial Group 15: PPC Cement) and Human or Animal Healthcare (Industrial Group 16) is of greatest importance and influence. It was an outcome of the previous generation IWMP review by DEADP that the municipality had to assess and report on the hazardous waste quantities through IPWIS. Although it has improved, the private waste generators are not reporting to the municipality directly.

The data contained in this survey was obtained from owners/employees at the various places of business directly and it must be noted that there is a general lack of knowledge regarding waste generation or disposal throughout the entire spectrum of Industrial Groups, excluding Group 16 (Healthcare) who were all able to provide accurate and up to date information. Information on hazardous waste types within the Bergrivier Municipality is given in the hazardous waste survey report included as **Annexure C** to the IWMP.

#### 3.3.5.3 Hazardous Waste Quantities

Where the waste generators provide information on the quantities of waste generated it was recorded and a summary of the total are presented in **Table 3.14** below. Some of the medical waste is reported as litres since the container used to dispose of the waste is a defined size and the volume of waste within each container was not known. Information is thus presented as obtained from waste generators.

**Table 3.14: Summary of Bergrivier hazardous waste quantities**

| Major Constituent per Waste Stream | Reported Quantities | | |
|---|---|---|---|
| | $m^3$/annum | tonnes/annum | litres/annum |
| 1. Diluted chlorine wash water (limited to 30ppm) | | 0.06 | |
| 2. Mercury complex solutions (Thimorasal) | 0.0025 | | |
| 3. Ash from charcoal | | 2,780.00 | |
| 4. Leftover food and meat off-cuts | 588.40 | 3.07 | |
| 5. PPC Cement – Various items | | 400.00 | |
| 6. Spent Thinners | 0.50 | | |
| 7. Spent Oil | 20.00 | | |
| 8. Old tyres | | 34.40 | |
| 9. Empty oil bottles | | 3.00 | |
| 10. Sharps | | 0.44 | 3,767.60 |
| 11. Infectious Waste | | 6.40 | 92,810.00 |
| 12. Pharmaceutical Waste | | 0.06 | 230.00 |
| 13. Anatomical Waste | | 0.32 | 240.00 |
| **TOTAL** | **609** | **3,228** | **97,050** |

#### 3.3.5.4 Household Hazardous Waste

Household Hazardous Waste (HHW) is not a priority identified by the municipality. The public is probably also not requesting a special service for HHW. Fluorescent tubes, batteries, lighters, household pharmaceuticals, electronics etc. from households are however very problematic and the waste characterisation study indicated that almost 1% of the household waste stream was made up of hazardous waste. Establishing easy to use collection points for this waste stream is one way in which the presence of fluorescent lightbulbs and other household hazardous waste items can be prevented from going to landfill. It is also important to know that a company recycling the content of the fluorescent tube for beneficiation, is opening a Cape Town office. For a minimal fee, the tubes are taken to the Ekurhuleni factory where the phosphorous is scraped off the glass, the mercury reclaimed, the metal electrodes re-used and the glass recycled. Waste contractors can make use of this option rather than disposal thereof.

## 3.4 EXISTING WASTE MANAGEMENT STRUCTURE, SYSTEMS AND PRACTICES

This section discusses the current solid waste management system in the Bergrivier Municipality. This includes the organisational structure of the Municipality, solid waste collection methods and vehicles, collection schedules, diversion, treatment and disposal.

### 3.4.1 Organisational structure

Solid waste management for the Bergrivier Municipality falls under Civil Engineering Services, of whom the manager is Mr J. Breunissen.

Chapter 3 of the Waste Act states that:

"10.(3) Each municipality authorised to carry out waste management services by the Municipal Structures Act, 1998 (Act No. 117 of 1998), must designate in writing a waste management officer from its administration to be responsible for co-ordinating matters pertaining to waste management in that municipality.

(4) A power delegated or a duty assigned to a waste management officer by virtue of subsection (3) may be sub-delegated of further assigned by that officer to another official in the service of the same administration, subject to such limitations or conditions as may be determined by the municipality.
(5) Waste management officers must co-ordinate their activities with other waste management activities in the manner set out in the national waste management strategy established in terms of section 6 or determined by the Minister by notice in the Gazette."

The designated Waste Management Officer for Bergrivier Municipality is Mr Jaco Breunissen who was appointed by Council as required by the Waste Act.

Provision must be made for the continuous training and education of the Bergrivier waste management employees. Waste management information sharing/capacity-building events such as the Departmental Waste Forum, Waste Khoro and the IWMSA's WasteCon should be attended by waste management employees determined by the Municipality.

The civil engineering services organogram is presented in Figure 3.9 below. The number of new (unfunded) and vacant posts are shown on the Organogram. These posts need to be filled as part of the IWMP implementation plan. A need exists for the waste management functions of the manager Civil Engineering Services to be delegated to a newly appointed position. The current Civil Engineering Services Manager has many responsibilities of which waste management is only one. With government and province rightly emphasising the importance of sustainable municipal waste management, the municipal responsibility for this function needs to be handled by a dedicated person, and thus a need exists to appoint a competent person for this function.

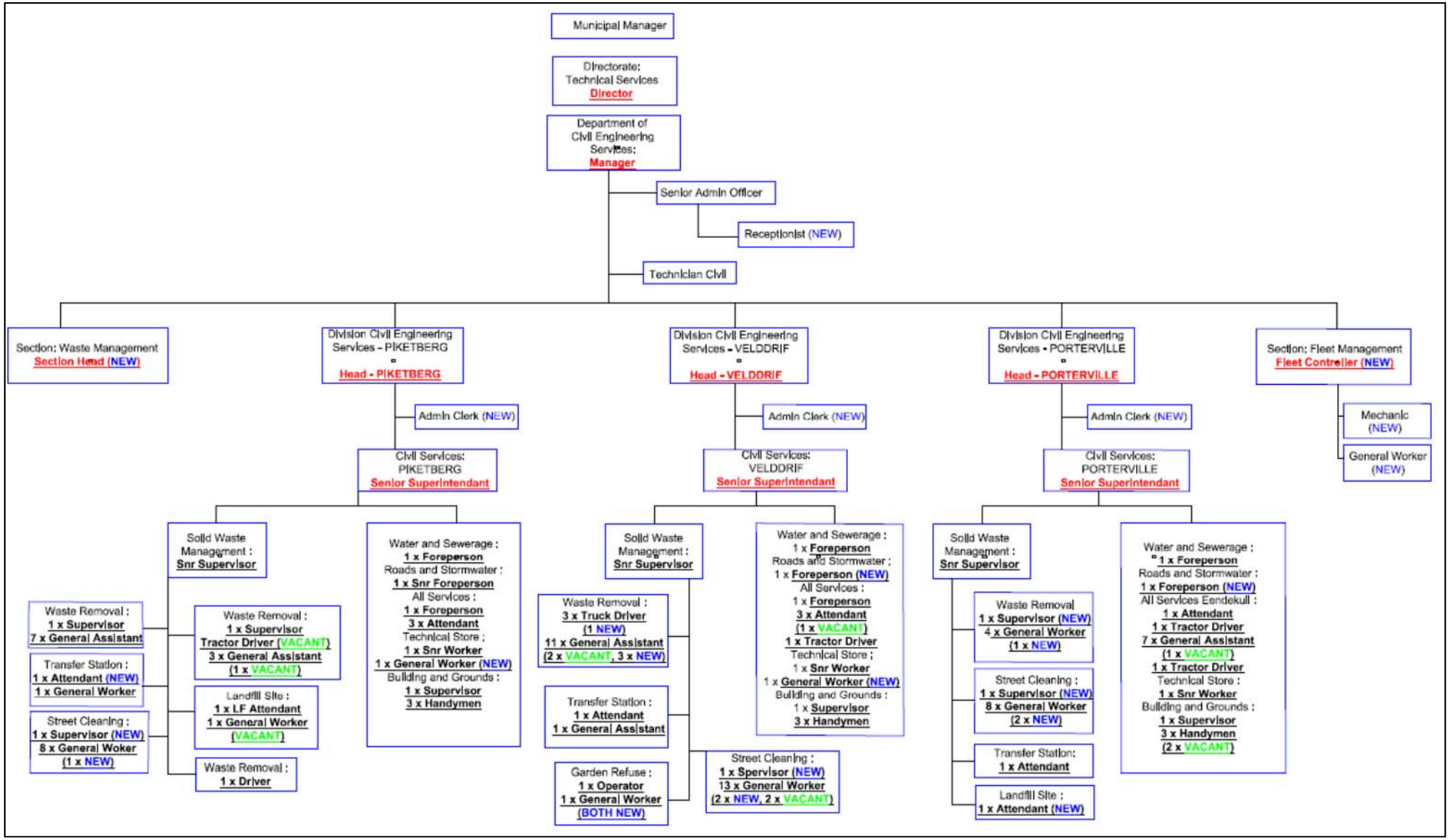



**Figure 3.9 Bergrivier Municipality Solid Waste Management Organogram**

### 3.4.2 Collection and cleansing services

The Bergrivier solid waste collection fleet and collection days are summarized in **Table 3.15**:

**Table 3.15: Waste collection fleet**

| Registration | Model | Make | Description | Condition | Purpose | Days and Areas |
|---|---|---|---|---|---|---|
| **Velddrif** | | | | | | |
| CBY 9226 | 2018 | Isuzu S Series | 9 tonne Flatbed | Excellent | Green Bags/Garden Waste | Monday: Dwarskersbos and Port Owen Green bags<br>Tuesday: Parks Green bags<br>Wednesday: Noordhoek and Laaiplek Green bags<br>Thursday: Velddrif Green bags<br>Friday: Parks Green bags. |
| CBY 8147 | 2015 | Isuzu N Series | 4 Tonne Tip Truck with Steel Cage | Excellent | Recycling Bags | Monday: Dwarskersbos and Port Owen Recycling bags<br>Tuesday: Velddrif, Laaiplek and Dwarskersbos Business Recycling Bags<br>Wednesday: Noordhoek and Laaiplek Recycling bags<br>Thursday: Velddrif Recycling bags<br>Friday: Dwarskersbos, Laaiplek and Velddrif Business Recycling Bags. |
| CBY 7858 | 2012 | Nissan UD 330 | 18 m³ Compactor | Good | Household and Business Waste | Monday: Dwarskersbos and Port Owen House Refuse<br>Tuesday: Aurora House Refuse<br>Wednesday: Noordhoek and Laaiplek House Refuse<br>Thursday: Velddrif House Refuse<br>Friday: Dwarskersbos, Laaiplek and Velddrif business refuse. |
| CFP 3004 | 2002 | Ford | Ranger 1800 | Needs a Service | Supervision | Daily |
| CFP 4198 | 2005 | Ford | 6600 Tractor | In Use | Illegal Dumping | Daily |
| CBY 6247 | 2008 | Komatsu | Digger Loader | Major Service Required | Clean-up at Transfer Station | Daily |
| CFP 3968 | 1995 | Trailer | 3 Tonne Tipper | Faulty, Requires Service | Illegal Dumping | Daily |
| **Piketberg** | | | | | | |
| CBY 7556 | 2017 | Nissan UD 330 | 14m³ Compactor | Excellent | Streets, Household and Business Waste | Monday: Business waste<br>Tuesday: Household<br>Wednesday: Household<br>Thursday: Street Bins<br>Friday: Business waste. |
| CFP 1315 | 2008 | Nissan UD 90 | 10 m³ Compactor | Good | Streets, Household and | Monday: Business garbage<br>Tuesday: Household<br>Wednesday: Household |

| Registration | Model | Make | Description | Condition | Purpose | Days and Areas |
|---|---|---|---|---|---|---|
| | | | | | Business Waste | Thursday: Street Bins<br>Friday: Business waste. |
| CBY 4305 | 2018 | Isuzu N Series | 4 Tonne Tip Truck with Steel Cage | Excellent | Streets | Cleaning streets with street sweepers |
| CBY 9158 | 2017 | New Holland | TT 75 Solos | Excellent | Illegal Dumping, Builders Rubble, Garden Waste | Daily |
| CBY 6247 | 2011 | Volvo, BL 61 | Digger Loader | Good | Illegal Dumping and Cleaning up at Transfer Station/Landfill Site | Daily |
| Private Contractor with own Vehicles / Equipment and Staff | | | | | Recycling Bags | Monday: Business waste<br>Tuesday: Household<br>Wednesday: Household<br>Thursday: Business garbage<br>Friday: Business garbage |
| CBY 9389 | 1984 | Trailer | 3 Tonne Tipper | Good | Illegal Dumping, Builders Rubble, Garden Waste | Daily |
| **Porterville** | | | | | | |
| CEX 1592 | 1997 | Isuzu FRR 500 | 6 Tonne Tip Truck with Steel Cage | Reasonable | Streets, Household and Business Waste | Monday: Street Bins<br>Tuesday: Business garbage<br>Wednesday: Green bags<br>Thursday: Street bins<br>Friday: Garden refuse |
| CBY 1861 | 2010 | Nissan UD 330 | 18 m³ Compactor | Good | Household Waste/Transfer Station | Monday: PV bins to PB<br>Tuesday: House Refuse PB<br>Wednesday: House Refuse EK & RH<br>Thursday: House Refuse PV<br>Friday: PV bins to PB |

| Registration | Model | Make | Description | Condition | Purpose | Days and Areas |
|---|---|---|---|---|---|---|
| CBY 6247 | 2011 | Volvo, BL 61 | Digger Loader | Good | Loading Illegal Dumping, Clean up at Transfer Station/Landfill Site | Daily |
| Private Contractor with own Vehicles / Equipment and Staff | | | | | Recycling bags | Monday: Business garbage<br>Tuesday: House Refuse<br>Wednesday: House Refuse<br>Thursday: Business waste<br>Friday: Business waste |

It is advisable that collection vehicles should ideally not be operated beyond 7 to 8 years in age since the maintenance costs increase dramatically with age as well as down-time which also has cost-implications. It is recommended that all vehicles above 8 years are evaluated to determine the need for replacement. In the event that a vehicle is temporarily out of operation, its function is covered with a vehicle/s from other departments as solid waste collection takes priority.

### 3.4.3 Levels of service

Bergrivier has been divided into collection areas that have a fixed day per week when waste is collected as shown in the above table. All formal residential households receive door-to-door waste collection services but there are scattered rural farming communities within the municipality that do not receive a waste collection service since they are located long distances from the towns and thus manage their own waste. Although the Municipality does not collect waste per household at Goedverwacht, De Hoek and Wittewater, this service is done through a private company and transported to the transfer station in Piketberg.

Commercial waste is collected on the same scheduled rounds. Garden waste is collected on request. Collection services are not rendered to farms and rural households because of the transport distances. Nearby farmers off-load their waste at the drop-offs or transfer stations themselves and rural farmers manage their own waste. The municipality's 2016/17 Annual Report shows that households receiving a weekly waste collection service grew from 67% in 2011 to 84% in 2016. The current Municipal Waste Management Officer indicated that currently 100% of registered households receive a weekly refuse collection service.

The residences use refuse bags and the collection frequency is once per week. Two black bags are allowed per household per collection. Source separation is practised and clear bags are used for recyclable waste. The clear bag is filled with mixed recyclables and is collected separately for processing. Green bags are used for garden waste and are collected separately as well.

In terms of free basic services there are 1753 registered indigent households in the Bergrivier Municipal area who qualify for free basic services according to the 2016/2017 annual report. The Municipality reports 100% service to these households and this number is down from 2208 as reported in the previous IWMP in 2013/14.

### 3.4.4 Waste related complaints

The Bergrivier Municipality makes use of a formal complaints register. All complaints received are logged on their internal system. Each town has its own client services official who records the complaint and the responsible person is entered into the system along with the complaint. The responsible person can then see all details of the complaint when he logs in and performs the necessary task or delegates it. Feedback must be entered in order to finalise the entry.

The only complaints that were received were related to illegal dumping and farmers having to pay for offloading waste at the transfer station. The calls regarding the illegal dumping were the public informing the Municipality of places where illegal dumping took place. The farmers' complaints were that if they are paying taxes, they should be able to offload their waste free of charge at the transfer station. The Waste Management Officer entered into discussion with these persons to clarify that the tariffs (refer section 3.7) are required for transfer station operation. As Bergrivier does not make use of disposal sites within the Municipal boundaries, there are transport costs to be considered as well as disposal fees at the landfill sites that are being used. This service cannot be rendered free of charge.

### 3.4.5 Waste minimisation, re-use, recycling initiatives

#### 3.4.5.1 Recyclers

The Bergrivier Municipality has appointed two private recyclers; one operating per transfer station.

Piketberg Civils is operating at the Piketberg transfer station. They do the collection of the clear bags (source separated recyclables) in Piketberg. The Municipality collects the recyclables from Eendekuil and Porterville and transports it to the recycler. Additional recyclables are also offloaded directly at the transfer station by the public.

Henque Waste currently operates the recycling centre at the Velddrif transfer station. The Municipality collects the recyclables in Aurora, Velddrif and Dwarskersbos and transports it to the Velddrif transfer station where the recycler processes it.

### 3.4.5.2 Recycling statistics

The available recycling quantities and types of recycled material were provided by the Municipality for the recycling facilities at the Velddrif and Piketberg Transfer Stations. These facilities mainly focus on the recycling of Plastic, Cardboard (and paper), Metals and Glass as shown in the figures below. The Velddrif RTS recycles on average about 24 tonnes per month and the Piketberg RTS recycles in the order of 26tonnes per month total.

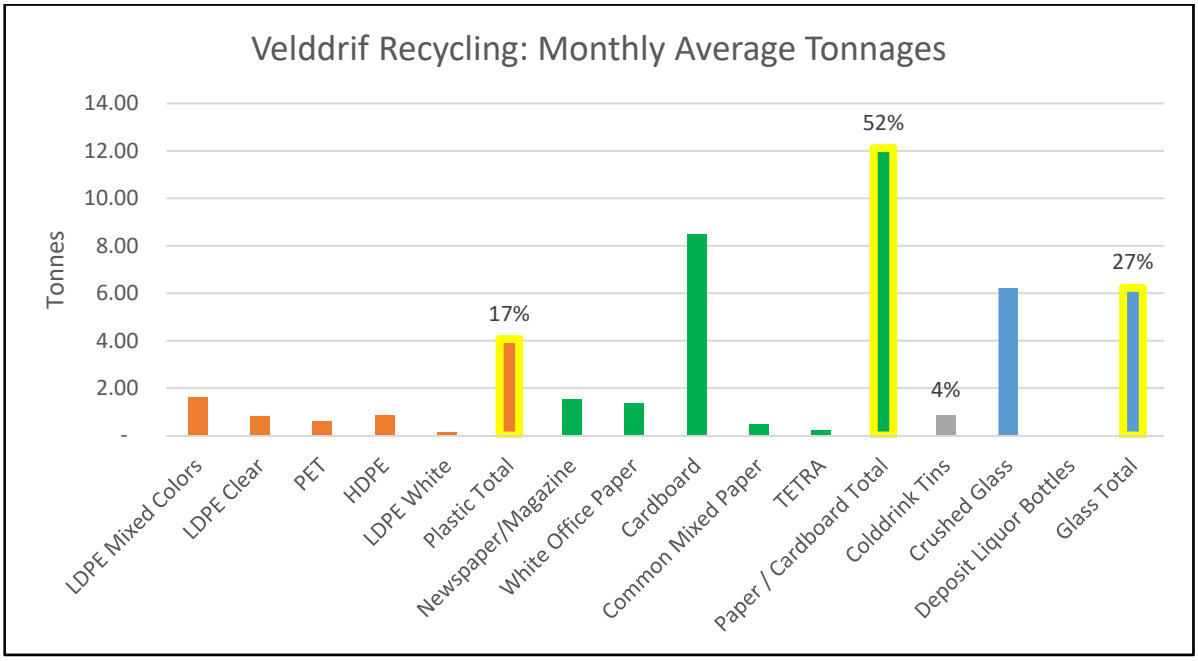



**Figure 3.10: Recycling Statistics Velddrif RTS**

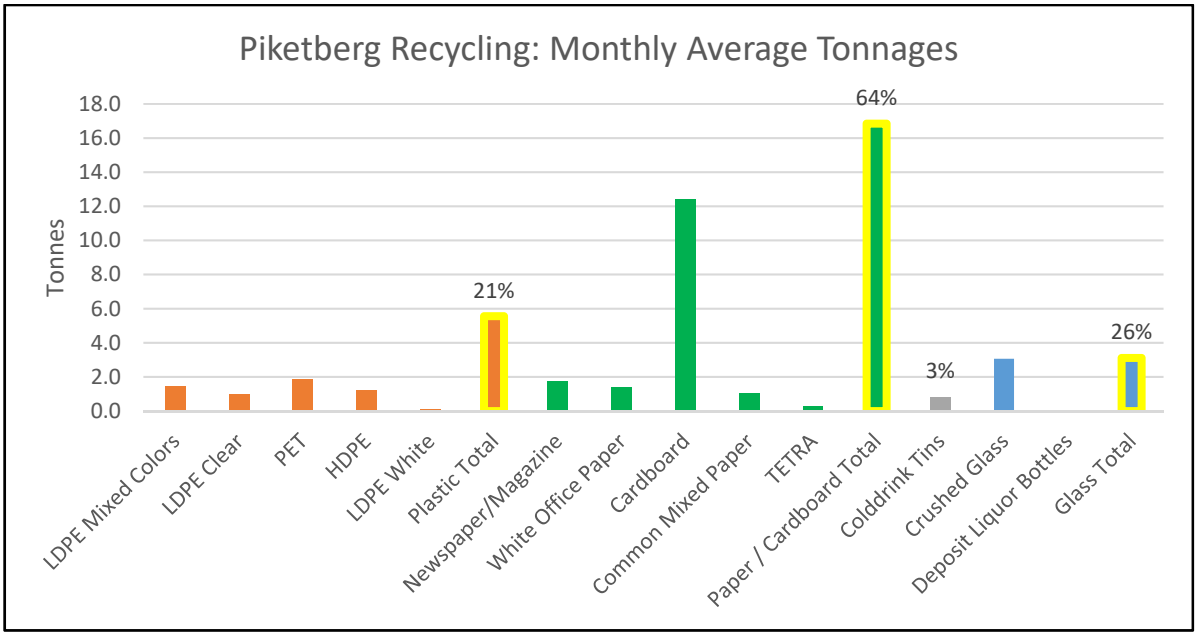



**Figure 3.11: Recycling Statistics Piketberg RTS**

From the above information the impact of recycling on the diversion of waste from landfill equates to an average of almost 600 tonnes per annum resulting in an 8% diversion per mass. The latest (May 2018) prices for baled recyclable materials per type delivered to Cape Town are as shown in **Table 3.16**.

**Table 3.16: May 2018 Prices of Recovered Materials**

| MATERIAL | PRICE IN RAND/TONNE FOR BALED MATERIAL |
|---|---|
| Card board | 1400 |
| White Paper | 2 500 |
| Newsprint | 950 |
| Mixed Paper | 600 |
| | |
| Metals (Mainly cans) | 1 600 |
| | |
| Glass (All colours, Crushed) | 400 |
| | |
| Plastic (PET, No 1, White, Blue) | 4 800 |
| Green PET | 3 800 |
| Plastic (PET, No 1, Brown & other colours) | 3 000 |
| Plastic (HDPE, No 2) | 4 300 |
| Plastic (LDPE) | Unwashed: 1 600 Washed: 3 000 |
| Plastic (Polypropylene, No 5) | 1 500 |
| Plastic (Polystyrene, No 6) | Currently no buyers |

In the preceding months the recycling market has been volatile. Card board reached a high of R2 000 per tonne, but is currently falling (R1 400/t at the time of writing). Prices for all plastics has seen a quick increase – likely as a result of the recent increase in oil prices. Metal is fetching a higher price than normal and glass has been constant.

#### 3.4.5.3 Organic waste and builder's rubble diversion

Organic Waste:
The municipality has a system for the separate collection of garden waste from households and businesses through use of a green bag. Green bag waste is taken to either the old Piketberg landfill or the Velddrif transfer station where it is chipped and stored. Currently the chipped waste largely remains on site and plans need to be put in place for the chipped waste to be removed. This is especially applicable to the Velddrif situation since the Velddrif transfer station is not licensed for the disposal of waste.

The organic fraction of the generated and collected household waste stream is 25.69% by weight as per the waste characterisation study discussed in 3.3.3 above. This is made up almost entirely of food waste with a very minor portion of garden waste. Currently the household organic (food) waste is mixed with the residual general waste and sent to landfill.

Composting of garden waste at a centralised composting facility requires approximately a minimum 350 tonnes of garden waste per month (4,200 per annum) in order to achieve financial sustainability. From the volumes estimated from loads received, it was calculated that the Bergrivier Municipality treats approximately 1 700 tonnes of garden waste per annum at the Velddrif RTS, and 680 tonnes per annum at the Piketberg RTS with an additional 665 tonnes per annum going to the closed Porterville landfill. These volumes do not allow for the sustainable operation of a standalone composting facility and an alternative for the green waste in Bergrivier must be sought. Agreements can possibly be made with other Municipalities to contribute to a cross border centralised facility and this can be explored. This does not imply that establishing a Bergrivier composting facility is unsustainable, it would just require financial support because of the low volumes of garden waste. The costs that can be saved through avoided transport and disposal fees to remote landfills in other municipalities must be kept in mind.

Builder's Rubble:
It is reported that approximately 6 000 tons of builder's rubble gets disposed of at the landfills and Velddrif transfer station in Bergrivier annually. About 3 800 tons per annum is disposed of at the Velddrif transfer station alone, and this is creating a challenge since the waste is not removed from site and this facility is not licensed as a landfill site.

Builder's rubble can be either utilised as a cover material on a landfill without any significant form of treatment or it can be crushed and used as a filling material, road building material or brick making material. The choice of reuse is largely determined by the available quantities, since a small crusher can crush up to 120 tonnes per hour. However when feeding of rubble into a crusher is done with only one loader and not by an in-feed conveyor belt, then the capacity is limited to the effectiveness of the loader and would then typically be approximately 105$m^3$ per day.

Considering the reported tonnages of builder's rubble, the smallest crusher, fed by one loader, will require less than 30 days per year to crush all the builder's rubble disposed of at the Velddrif transfer station. With the builder's rubble on site estimated to be almost 10 000$m^3$ it will be possible to crush all the builders rubble on site in less than 100 days, even with a small crusher.

What would typically be advised for a Municipality that generates volumes of builder's rubble that are too small to permanently occupy a crushing plant, is to stockpile builder's rubble until a sufficient volume, say 5 days of crushing, is available that would economically justify the temporary establishment of a mobile crushing plant. Spatial provision for such a storage area can be made under the existing WML conditions since the crushing of builder's rubble is normally one of the listed activities in the WML.

The capital requirement to procure a crusher would be approximately R4 Million and the municipal operation thereof would amount to some R0.5 Million per annum. The capital cost to add a crushing area to a licenced composting facility would, however, only be about R1.8 Million. The total net cost, capital and operational, for the Municipality to establish a crushing area on a licenced area, procure a crusher, crush the rubble departmentally and use the crushed material internally, would be in the order of R100 to R150 per tonne of builder's rubble. Should the municipality contract external service providers to render this service, the net cost would be approximately R80 per tonne or less, but the Municipality would still need to provide the crushing area. This net cost makes provision for a saving per tonne of having to procure this filling material commercially and shows that the Bergrivier municipality should rather outsource the beneficiation of builder's rubble than procure and operate a crusher themselves. This also provides the opportunity to award this work (in possible combination with garden waste chipping) to a SMME contractor and in this way give back to the community.

### 3.4.6 Awareness & Education

The Bergrivier Municipality is active in raising awareness and providing education on sustainable waste management within their jurisdiction. The Municipality distributes pamphlets pertaining to solid waste management information to its residents and these pamphlet also provide information on how the separate collection and recycling systems work. Information on waste collection and treatment is also available on the municipality's website.

The 2016/17 Annual Report indicates that a business plan was approved by the Federal Government in Belgium to implement projects in Monte Bertha Porterville, Ward 4 Piketberg and Noordhoek Velddrif, to appoint and train waste ambassadors to clean the respective area's and also use the FLOW (Foster Local Wellbeing) program for public awareness campaigns with the goal to create a cleaner and healthier environment. The project will be implemented in the next financial year.

The municipality is also involved in the following public awareness and education campaigns:

- Council members accompanies the waste collection truck from time to time and discusses the separate collection system and the importance of recycling with the members of the public;
- Kids are informed of recycling at school and they are included in town cleaning projects;
- The recyclers appointed at the Velddrif and Piketberg Transfer Stations have a clause in their contract that requires them to undertake awareness and education campaigns in town.

### 3.4.7 Waste disposal facilities

The operational and closed waste disposal facilities in the Bergrivier Municipal area are discussed in this section.

#### 3.4.7.1 Landfills

**Operating Landfills**

The Bergrivier Municipality currently has no licensed waste disposal sites and as a result remaining airspace volumes are not applicable to Bergrivier. The remaining lifetime estimates for the closed sites are discussed later and are effectively nil, but cannot be rehabilitated immediately because of budget constraints. The remaining lifetimes of the drop-off facilities and transfer stations are indefinite with regular maintenance or subject to license renewals and approvals.

All collected municipal waste is off-loaded either at the Piketberg or Velddrif Refuse Transfer Stations for long haul transport. Waste from the Velddrif transfer station is transported for disposal at the Vredenburg landfill as per agreement with the Saldanha Bay Municipality. Waste from the Piketberg transfer station is transported for disposal at the Highlands landfill near Malmesbury as per agreement with the Swartland Municipality.

**Closed Landfills**

There are a number of closed waste disposal sites within the Bergrivier Municipal area that have been closed after the commissioning of the two transfer stations. These sites are located near Aurora (S32°42'49.39"; E18°29'14.30"), Piketberg (S32°53'57.20"; E18°46'36.49"), Porterville (S33°02'10.38"; E18°59'26.78"), Redelinghuys (S32°29'12.01"; E18°31'42.19") and Velddrif (S32°45'35.2"; E18°09'55.52").


**Figure 3.12: Closed Aurora Landfill (Yellow Border) and Drop-off (Red Border)**


**Figure 3.13: Closed Piketberg Landfill**


**Figure 3.14: Closed Porterville Landfill**


**Figure 3.15: Closed Redelinghuys Landfill**


**Figure 3.16: Closed Velddrif Landfill**

The DEA is assisting Municipalities in acquiring licenses for all unlicensed sites. The closure license for Aurora (Ref. nr: 19/2/5/4/F1/1/WL0027/18), Piketberg (Ref. nr: 19/2/5/1/F1/11/WL0026/18), Porterville (Ref. nr: 19/2/5/4/F1/12/WL0028/18), Velddrif (Ref nr: E13/2/10-F1/14-WL0036/10) and Redelinghuys (Ref. nr: 19/2/5/4/F1/13/WL0029/18) has been issued and updated in April 2018.

The following table shows the rehabilitation cost estimates as at June 2018. The implementation section show these cost estimates escalated to the planned year of rehabilitation.

| Landfill | Aurora | Piketberg | Porterville | Redelinghuys |
|---|---|---|---|---|
| Rehab cost estimate (excl. VAT) | R5,294,242.79 | R30,875,605.99 | R27,615,476.75 | R2,616,737.51 |

The estimate for the Velddrif landfill has not been included and as per agreement the land owner will be responsible for rehabilitation. The Bergrivier Municipality has submitted a request to Environmental Governance to transfer the license to the land owner.

Provision must be made in order to rehabilitate the Aurora, Piketberg, Porterville and Redelinghuys Landfills in line with the closure licenses issued. Commencement dates for decommissioning is currently between August and September 2019 and an application to extend these dates would be required if commissioning does not commence in time. Similarly these closed sites also require internal and external audits to be conducted in accordance with their recently amended closure licenses.

#### 3.4.7.2 Garden Waste & Builder's Rubble Sites

There are no dedicated garden waste or builder's rubble sites in Bergrivier. Garden waste is chipped and stored at the Piketberg and Velddrif Transfer Stations and is available for farmers or industry to use.

Builder's rubble is currently placed at the Velddrif transfer station and the Piketberg landfill and is creating a challenge in Velddrif since this facility is not licensed for the disposal of builder's rubble. The builder's rubble needs to be removed from this site urgently and beneficiated. This can be done by breaking it down mechanically and using it as cover material at the landfill sites.

#### 3.4.7.3 Waste Transfer Stations

The Bergrivier Municipality operates two Solid Waste Transfer Stations at Piketberg and Velddrif. Both facilities have authorisations (Piketberg RTS 2005 RoD Ref: E12/2/1-AP10 and Velddrif 2008 License Ref: 12/9/11). The Piketberg Recycling Facility was issued with a license to recycle in May 2014 (License number 19/2/5/1/F1/11/WL0070/13). The Velddrif Recycling Facility was also issued with a license to recycle in May 2014 (License number 19/2/5/1/F1/14/WL0071/13). Both licenses are valid for ten years. Provision must be made to appoint external auditors to conduct annual audits of these facilities to determine their compliance according to the license conditions.


**Figure 3.17: Piketberg Solid Waste Transfer Station**


**Figure 3.18: Velddrif Solid Waste Transfer Station**

Waste that is collected by the Municipality at Eendekuil, Piketberg, Porterville and Redelinghuys is transported to the Piketberg transfer station from where it is hauled for disposal at the Highlands landfill near Malmesbury. Waste that is collected at Aurora, Velddrif and Dwarskersbos is transported to the Velddrif transfer station from where it is hauled to the Vredenburg landfill.

#### 3.4.7.4 Public Drop-off Facilities

Public Drop-off Facilities have been provided in Aurora (S32°42'50.36"; E18°29'13.04") and Porterville (S33°0'58.50"; E18°59'12.53"). These facilities receive only general waste and do not require licensing. Waste is transported from the Aurora drop-off to the Velddrif transfer station and from the Porterville drop-off to the Piketberg transfer station.

**Figure 3.19: Aurora Drop-off**

**Figure 3.20: Porterville Drop-off**

#### 3.4.7.5 Disposal Facilities used outside the Bergrivier Municipality Boundaries

The hazardous waste generated in Bergrivier Municipality will be transported to the privately owned Vissershok Waste Management Facility (VWMF) by contractors acting on behalf of the generators of such waste. The municipality is not responsible for the management of hazardous wastes. The Vissershok site has a H:H operating permit from DWAF. The site is situated some 800m west of the N7 at Vissershok and is operated and audited in terms of its permit conditions.

The general waste disposal facilities used outside the Bergrivier Municipal borders are the Vredenburg and Highlands landfills as discussed above.

#### 3.4.7.6 Contaminated Land

There are no known contaminated land or unpermitted landfills prior to ECA 1989 in Bergrivier Municipality. All contaminated land is discussed under “Closed Landfills”.

#### 3.4.7.7 Informal Salvaging

At some of the waste management facilities this has been identified as a concern. Although with security fencing and a security guard present, large groups of informal salvagers gain entry to the facilities and salvage what they can before law enforcement arrives to assist with control. Funding does not allow for more security guards and one security guard cannot control these large groups when they arrive.

The transfer stations at Piketberg and Velddrif have each received a license for recycling. Private contractors are currently appointed for the recycling activities. These recyclers are already discussing the possibilities with the Municipality in order to formalise the recycling activities of the informal salvagers. Discussions continue in order to establish the best way forward for optimal and sustainable waste beneficiation.

## 3.5 ECONOMICS AND FINANCING OF SOLID WASTE MANAGEMENT PRACTICES

### 3.5.1 Current Solid Waste Management System Costs & Budget

**Table 3.17** below reflects the Bergrivier Capital Budget for the waste management section up to the year 2021 and **Table 3.18** reflects the current and future operational budget for the municipality's waste management, which includes the cost of providing a collection service to the indigent households. The budgets show that the municipality clearly does not have the funding available to close and rehabilitate the old landfill sites as discussed in section 3.4.7.1.

**Table 3.17: Bergrivier Waste Management Capital Budget**

| Town | Description | Budget 2018/19 | Funding 2018/19 | Budget 2019/20 | Funding 2019/20 | Budget 2021 | Funding 2021 |
|---|---|---|---|---|---|---|---|
| Redelinghuys, Dwarskersbos, Eendekuil | Refuse collection point (RH/DKB/EK) | | External Loans | | External Loans | R1 900 000 | External Loans |
| Porterville | Recycling Building | | | | | R1 500 000 | External Loans |
| Municipality | Furniture & Equipment - Refuse Removal | R6 000 | Capital Reserve Fund | R6 000 | Capital Reserve Fund | R6 000 | Capital Reserve Fund |
| Municipality | Tools | R6 000 | Capital Reserve Fund | R6 000 | Capital Reserve Fund | R6 000 | Capital Reserve Fund |
| Piketberg | Refuse carts | R10 000 | Capital Reserve Fund | R14 000 | Capital Reserve Fund | R16 000 | Capital Reserve Fund |
| Municipality | Refuse Bins and stands | R30 000 | Capital Reserve Fund | R30 000 | Capital Reserve Fund | R40 000 | Capital Reserve Fund |
| Piketberg | Establish composting facility (VD/PB) | R100 000 | External Loans | R200 000 | External Loans | R300 000 | External Loans |
| Velddrif, Piketberg | Enlarge recycling building (VD/PB) | R700 000 | External Loans | R400 000 | External Loans | | |
| Municipality | Refuse compactor | | | R1 800 000 | External Loans | | |
| Velddrif | Fence at Transfer Station | R250 000 | Capital Reserve Fund | R250 000 | Capital Reserve Fund | R250 000 | Capital Reserve Fund |
| Velddrif | Fence at Transfer Station | | | | | | |
| Porterville | Walk Behind Roller | | | R180 000 | Capital Reserve Fund | | |
| | **Total** | **R1 102 000** | | **R2 886 000** | | **R4 018 000** | |

**Table 3.18: Bergrivier Municipality Waste Management Operational Budget**

| Description | Budget 2018/19 (Rand) | Budget 2019/20 (Rand) | Budget 2020/21 (Rand) |
|---|---|---|---|
| **Solid Waste Removal** | | | |
| Salaries | 3 377 000 | 3 559 000 | 3 755 000 |
| Temporary Workers | 3 000 | 3 000 | 3 000 |
| Housing | 121 000 | 128 000 | 135 000 |
| Bonus | 281 000 | 296 000 | 312 000 |
| Support | 103 000 | 109 000 | 115 000 |
| Long Service | 60 000 | 63 000 | 66 000 |
| Observation allowance | 50 000 | 53 000 | 56 000 |
| Overtime (Non-Structured) | 480 000 | 506 000 | 534 000 |
| Leave Payoff | 40 500 | 43 000 | 45 000 |
| Group Insurance | 64 000 | 67 000 | 71 000 |
| Medical | 152 000 | 160 000 | 169 000 |
| Industry Bodies | 4 000 | 4 000 | 4 000 |
| Pension | 608 000 | 641 000 | 676 000 |
| UIF | 34 000 | 36 000 | 38 000 |
| Admin Cost | 573 395 | 573 395 | 573 395 |
| Fuel | 620 000 | 653 000 | 689 000 |
| Chemicals | 6 000 | 6 000 | 6 000 |
| Services | 60 659 | 64 000 | 68 000 |
| Printing | 2 200 | 2 000 | 2 000 |
| Tools & Equipment | 28 000 | 30 000 | 32 000 |
| Rent: Machines | 165 000 | 174 000 | 184 000 |
| Licenses: Vehicles | 135 000 | 142 000 | 150 000 |
| Materials & Parts | 20 000 | 21 000 | 22 000 |
| Pesticides | 30 000 | 32 000 | 34 000 |
| Training | 10 000 | 11 000 | 12 000 |
| Training Fee | 37 653 | 40 000 | 42 000 |
| Professional Services | 4 400 000 | 4 638 000 | 4 893 000 |
| Legal Fees | 5 000 | 5 000 | 5 000 |
| Travel & Accommodation | 2 000 | 2 000 | 2 000 |
| Travel & Accommodation (Daily Allowance) | 1 000 | 1 000 | 1 000 |
| Travel & Accommodation (Own Transport) | 3 000 | 3 000 | 3 000 |
| Cellphone Cost | 1 000 | 1 000 | 1 000 |
| Stationary | 10 500 | 11 000 | 12 000 |

| Description | Budget 2018/19 (Rand) | Budget 2019/20 (Rand) | Budget 2020/21 (Rand) |
|---|---|---|---|
| Subscription Fees | 13 000 | 14 000 | 15 000 |
| Signs (Traffic and Information) | 3 000 | 3 000 | 3 000 |
| Safety Clothing | 53 000 | 56 000 | 59 000 |
| Insurance: General | 67 253 | 71 000 | 75 000 |
| Insurance: Excess Payment | 5 000 | 5 000 | 5 000 |
| Refreshments | 4 000 | 4 000 | 4 000 |
| Garbage Bags | 1 370 000 | 1 444 000 | 1 523 000 |
| Income Abdication | 4 147 000 | 4 371 000 | 4 611 000 |
| Buildings and Grounds | 8 000 | 8 000 | 8 000 |
| Machines | 2 000 | 2 000 | 2 000 |
| Radios | 3 000 | 3 000 | 3 000 |
| Vehicles | 550 000 | 580 000 | 612 000 |
| External Rent | 65 546 | 69 000 | 73 000 |
| Non Amortized Rent | 3 015 068 | 3 178 000 | 3 353 000 |
| Depreciation - Furniture and Office Equipment | 6 043 | 6 000 | 6 000 |
| Depreciation - Solid Waste Infrastructure - Landfill Sites | 3 073 566 | 3 240 000 | 3 418 000 |
| Depreciation - Solid Waste Infrastructure - Waste Transfer Stations | 389 201 | 410 000 | 433 000 |
| Depreciation - Solid Waste Infrastructure - Waste Processing Facilities | 33 809 | 36 000 | 38 000 |
| Depreciation - Solid Waste Infrastructure - Waste Drop Off Sites | 40 922 | 43 000 | 45 000 |
| Depreciation - Solid Waste Infrastructure - Waste Separation Facilities | 36 884 | 39 000 | 41 000 |
| Depreciation - Machinery and Equipment | 226 377 | 239 000 | 252 000 |
| Depreciation - Operational Buildings - Municipal Offices | 15 446 | 16 000 | 17 000 |
| Depreciation - Transport Assets | 258 594 | 273 000 | 288 000 |
| Bad Debt | 680 330 | 717 000 | 756 000 |
| Availability | -3 081 000 | -3 247 000 | -3 426 000 |
| Diverse | -26 306 | -28 000 | -30 000 |
| Subsidy - Compassion | -4 147 000 | -4 371 000 | -4 611 000 |
| Garbage Bags | -3 264 | -3 000 | -3 000 |
| Refuse Removal - Household | -21 948 000 | -23 133 000 | -24 405 000 |
| Refuse Removal - Transfer Stations | -377 434 | -398 000 | -420 000 |
| Refuse Removal - Garden | -50 325 | -53 000 | -56 000 |
| **Solid Waste Removal Total** | **-4 078 385** | **-4 299 000** | **-4 535 000** |

| Description | Budget 2018/19 (Rand) | Budget 2019/20 (Rand) | Budget 2020/21 (Rand) |
|---|---|---|---|
| **Street Cleaning** | | | |
| Salaries | 1 934 000 | 2 038 000 | 2 150 000 |
| Temporary Workers | 3 000 | 3 000 | 3 000 |
| Housing | 76 000 | 80 000 | 84 000 |
| Bonus | 161 000 | 170 000 | 179 000 |
| Support | 23 000 | 24 000 | 25 000 |
| Long Service | 13 000 | 14 000 | 15 000 |
| Overtime (Non-Structured) | 199 000 | 210 000 | 222 000 |
| Leave Payoff | 23 200 | 24 000 | 25 000 |
| Group Insurance | 37 000 | 39 000 | 41 000 |
| Medical | 76 000 | 80 000 | 84 000 |
| Industry Bodies | 2 000 | 2 000 | 2 000 |
| Pension | 349 000 | 368 000 | 388 000 |
| UIF | 20 000 | 21 000 | 22 000 |
| Admin Cost | 6 008 | 6 008 | 6 008 |
| Chemicals | 3 000 | 3 000 | 3 000 |
| Tools & Equipment | 6 000 | 6 000 | 6 000 |
| Licenses: Vehicles | 5 000 | 5 000 | 5 000 |
| Materials & Parts | 10 000 | 11 000 | 12 000 |
| Training Fee | 18 113 | 19 000 | 20 000 |
| Safety Clothing | 23 000 | 24 000 | 25 000 |
| Insurance - Excess Payment | 5 000 | 5 000 | 5 000 |
| Vehicles | 10 000 | 11 000 | 12 000 |
| **Street Cleaning Total** | **3 002 321** | **3 163 008** | **3 334 008** |
| **Combined Total** | **-1 076 065** | **-1 135 992** | **-1 200 992** |

**NOTE: Negative values in above table shows income and positive values shows expenditures**

### 3.5.2 Tariffs and billing

The current solid waste tariffs are as per **Table 3.19** below:

**Table 3.19: Levies & Tariffs**

| Tariffs applicable with first invoice delivered after 1 July or as indicated. | Tariff from 1 July 2016 |
|---|---|
| **ALL TARIFFS INCLUDE VAT** | **R** |
| One pack of 25 refuse bags is provided once every 6 months free of charge to each household. It is the responsibility of the owner/resident to make sure that they received it. | |
| **a) Household** | |
| Removal once per week – per month | 191.00 |
| Goedverwacht/Wittewater | **Actual Cost** |
| **b) Business** | |
| Per load or part thereof during working hours | 666.00 |
| **c) Garden Refuse** | |
| Per load or part thereof | 170.00 |
| **d) Refuse Bags** | |
| Per pack of 25 | 39.00 |
| **e) Builder's Rubble** | |
| Per load or part thereof | 352.00 |
| | |
| Household originating outside town area (3bags) | 56.00 |
| Bakkie (0.5 tonne - 1 tonne) | 105.00 |
| Truck (1 - 3 tonne) half load | 156.00 |
| Truck (1 - 3 tonne) full load | 314.00 |
| Truck (3 - 5 tonne) half load | 314.00 |
| Truck (3 - 5 tonne) full load | 522.00 |
| Truck (5 - 10 tonne) half load | 522.00 |
| Truck (5 - 10 tonne) full load | 1 044.00 |

## 4. GAPS AND NEEDS ASSESSMENT

From the status quo evaluation the gaps and needs were identified and are discussed below. The methodology used to determine these gaps and needs were through a combination of the following methods and processes:

- Gaps and Needs specifically identified by the municipality's waste management officer during the meetings between JPCE and the municipality;
- Complaints, comments and suggestions made by members of the public during the public consultation process of the IDP;
- Shortcomings of municipal infrastructure and/or systems to adhere to the national and provincial requirements of waste volume recording and reporting and management;
- Processes and practices identified that could assist the municipality to adhere to the principles of the National Waste Management Strategy and the NEMA Waste Act and its regulations.

### 4.1 LEGISLATION

In terms of local municipal legislation, the by-laws are outdated. The municipal waste disposal by-laws were written in 2009 and require an update to comprehensive integrated waste management by-laws.

The general awareness of the latest legislation has been identified as a gap. Various waste generators (especially hazardous waste) are unaware of the requirements listed in legislation pertaining to the transport and disposal of waste.

The non-compliances (where applicable) at municipal solid waste facilities need to be comprehensively assessed through internal and external audits. These findings must be communicated to the DEADP.

Disposal facilities that have been issued with closure licences require rehabilitation to commence before the dates specified in the licences in order to achieve compliance.

## 4.2 WASTE GENERATION QUANTITIES

Information on waste tonnages being disposed of at the Vredenburg and Malmesbury landfills are available from the operators of these landfills since they have weighbridges and record all the waste entering the facility. Weighbridges at the Velddrif and Piketberg transfer stations have only recently been installed and the Velddrif weighbridge is not yet operating optimally. All waste entering and exiting the facilities need to be weighed and recorded in order to understand the mass balance of generation, recovery and disposal of waste within the municipality.

Quantities of hazardous waste generators are not easily accessible and in some cases not recorded correctly or accurately.

## 4.3 COLLECTION NEEDS

Services need to be maintained to all households and businesses. The recommendations made in the waste optimisation study for Bergrivier and the West Coast District Municipality Business Case for the Regional Landfill need to be implemented in order to optimise the collection vehicles and routes. The critical factor in this will be the establishment of the West Coast Regional Disposal Facility as this will determine the disposal destination as opposed to the current situation.

Several areas in the municipality need to be cleared of illegally dumped waste and more bins need to be provided to areas that require them.

## 4.4 WASTE TRANSFER AND DISPOSAL NEEDS

All waste drop off and transfer infrastructure needs to be well maintained in order to ensure that the public can easily access waste drop-off points for their non-collected waste.

There are a number of unrehabilitated, closed disposal sites in the Municipality. These sites have received closure licenses and need to be formally closed. This is however addressed in the implementation plan and the Municipality will rehabilitate these sites as the budget and/or external funding allows.

## 4.5 WASTE MINIMISATION, RECYCLING AND RE-USE INITIATIVES

Waste minimisation must continually be promoted throughout the Bergrivier Municipality. The recycling and recovery operations at the Velddrif and Piketberg transfer stations need to be optimised in order to improve waste diversion rates.

With the lack of remaining disposal sites in the Municipality, waste that needs to be disposed must be transported over large distances. The volumes of recoverable materials help somewhat to reduce disposal costs, but the recyclables must also be transported over large distances in order to be sold. The recycling industry is not yet fully developed in Bergrivier and requires support.

A strategy to achieve waste diversion targets as well as an organic waste and builder's rubble diversion plan must be generated and the levels of illegal dumping need to be reduced by stricter law enforcement on the perpetrators.

It is recommended that the municipality appoints a contractor to divert builder's rubble and organic waste from landfills through chipping, crushing and beneficiating the resultant material. The focus needs to be on the Velddrif transfer station since this facility is currently being operated in non-compliance with its waste license, which does not allow for the disposal of waste.

## 4.6 INSTITUTIONAL AND ORGANISATIONAL NEEDS

Vacant positions need to be filled and personnel need to receive continual training and education. The Municipality need to appoint a person dedicated to waste management that can look after all the municipality's waste management needs and report to Manager of Civil Engineering Services. Currently the Civil Engineering Services Manager is also the Waste Management Officer.

A need exists for the waste management functions of the manager Civil Engineering Services to be delegated to a newly appointed position. The current Civil Engineering Services Manager has many responsibilities of which waste management is only one. With government and province rightly emphasising the importance of sustainable municipal waste management, the municipal responsibility for this function needs to be handled by a dedicated person, and thus a need exists to appoint a competent person for this function.

## 4.7 IDENTIFICATION OF ALTERNATIVES

An alternative treatment for generated green waste and builder's rubble in Bergrivier must be found. The current method of chipping and storing chipped garden waste on site needs be addressed to ensure sustainability and encourage beneficiation. A centralised composting facility is a proposal that needs to be investigated. The high volumes of garden waste present at the Velddrif Transfer Station is a concern due to the possibility of pollution and it being a potential fire risk. The garden waste needs to be chipped on site and transported off site to be used privately or composted at a licensed composting facility. This needs to be a priority for the Municipality since the facility is currently operating in noncompliance with its waste license.

Builder's rubble is currently being stored at the Velddrif transfer station and is effectively creating a landfill since it is not beneficiated or removed. The builder's rubble needs to be reduced in size mechanically and transported to the closed landfills where it can be used as cover material. Alternatively, the builders rubble needs to be crushed/broken down and beneficiated. A mobile crushing contract can be procured for this purpose which will stimulate the growth of potential SMME contractors in the area. The removal of builder's rubble from the Velddrif site and the future crushing or treatment of builders rubble on site needs to be made a priority since the site is currently being operated in non-compliance with its license conditions.

In addition to the above, sustainable alternative technologies to replace landfilling of waste needs to be continually investigated.

## 4.8 FUNDING MECHANISMS

Funding mechanisms need to be explored. The cost requirements of many of the proposed projects cannot be funded by the civil engineering services department itself, even if it is operating with a profit. The amount of capital is simply too much without alternative sources of funds.

Waste minimisation, including composting and crushing of builder's rubble, will require financial support and continual public awareness and education (which is on-going and very important) is also a continuous expense.

The Municipality must make provision for the rehabilitation of closed landfills. With the requirements set in the latest issued licences (which take into account that sites were not constructed with impermeable base liners), the rehabilitation costs have become unaffordable in the short to medium term. It would be most beneficial if the funding allocation for landfill rehabilitation would come through, or be sourced by, the Provincial government systems.

## 4.9 PUBLIC AWARENESS AND EDUCATION

It is apparent from the amount of recyclables within the black bag waste stream (see results of WCS) that the general public is not aware of which items need to be placed in the clear bags for collection. The municipality already distributes pamphlets and provide information on their website, but more needs to be done to maximise on the separation of waste at source.

## 5. STRATEGY AND IMPLEMENTATION

Based on the gaps and needs identified, aligned goals of the IWMP and planned projects by the municipality, this section contains the objectives, timeline and required resources for implementation of the IMWP. These gaps and needs are linked to the main goals contained in the Western Cape Provincial IWMP.

<table>
<tr><th colspan="8">Goal 1: Strengthened education, capacity and advocacy towards Integrated Waste Management</th></tr>
<tr><th colspan="2">Objectives</th><th>2018</th><th>2019</th><th>2020</th><th>2021</th><th>2022 and on</th><th>Priority</th></tr>
<tr><td>Strategic Objective 1:</td><td>Facilitate consumer and industry responsibility in integrated waste management</td><td colspan="5" rowspan="2">Create a permanent position in the civil engineering services department or appoint a person that will address and co-ordinate the requirements of awareness and waste management. This person will co-ordinate the follow-up visits to the special and hazardous waste generators in the Bergrivier municipality to ensure that all these generators are aware of applicable legislation and are following steps to become compliant if required. This person will also oversee the information gathering as per legislation, in other words, ensure that generators and transporters report to the municipality as required. General public awareness and feedback on recycling issues and information will also fall under the duties of this person, including maintaining and improving upon the recycling information provide to the public.</td><td rowspan="3">High</td></tr>
<tr><td>Strategic Objective 2:</td><td>Promote and ensure awareness and education of integrated waste management</td></tr>
<tr><td rowspan="2">Strategic Objective 3:</td><td>Build and strengthen waste management capacity</td><td colspan="5">Bergrivier Municipality Solid Waste employees to attend education seminars and waste forums. Capacity training and education conducted within the Municipality where needed. It must be ensured that the engineering services department employees are informed regarding the latest legislation and how to appropriately handle and identify various waste types. Law enforcement departments must also be approached and receive education in solid waste legislation and management to enable them to identify issues and act when required.<br><br>The South African Institute of Waste Management (www.iwmsa.co.za) is a voluntary organization that provides training on the management of waste. The Bergrivier Municipality is encouraged to have their staff become members of this institute and to attend the training sessions that is available on their website.</td></tr>
<tr><td>Costs & Human Resources</td><td colspan="5">Costs to be determined (OPEX), funds received from Belgian Government Grant. One to two persons in the municipality required, or a consultant can be appointed for public awareness and education. Additional costs are dependent on the number of employees attending educational and capacity building events.</td></tr>
</table>

| Goal 2: Improved integrated waste management planning and implementation for efficient waste services and infrastructure | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **Objectives** | **2018** | **2019** | **2020** | **2021** | **2022 and on** | **Priority** |
| Strategic Objective 1: | Facilitate municipal waste management planning | Finalise 4th Generation IWMP, including a waste characterisation study. | Review IWMP and submit IWMP annual report along with implementation projects update. | Review IWMP and submit IWMP annual report along with implementation projects update. | Review IWMP and submit IWMP annual report along with implementation projects update. | Start IWMP 4th Generation development | High and already under way. |
| | Costs & Human Resources | R330 000.00. Appointed consultants and solid waste manager. | Can be done in-house by the solid waste manager. Cost estimate for consultant: R35 000.00 per report. | | | Cost to be determined with new tender/consultants. | |
| Strategic Objective 2: | Promote industry waste management planning | This objective is coupled with Goal 1, where the appointed persons will liaise with industry to ensure that they are aware of the relevant legislation. Follow-up meetings and on-going communication will ensure that industry sufficiently plans and implements actions in order to be compliant and reduce waste generation along with responsible handling/treatment/transport/disposal. | | | | | High |
| Strategic Objective 3: | Promote the establishment of integrated waste management infrastructure and services | Continued Collection Service Review: The Bergrivier Municipality must ensure that all residents receive an affordable waste service at an acceptable level. Current service levels need to be improved where possible. The civil engineering services department must liaise with the town planning department to stay up to date with new areas that require or will require services. The complaints registry and service requests must be reviewed daily by the Waste Management Officer. The older Municipal collection vehicles currently in the Municipal fleet aged above 7 to 8 years, must be assessed in terms of running cost and effectivity. Where vehicles are operating beyond their effective economic lifetimes or are not the most efficient vehicles for their functions, they must be replaced. It must also be ensured that each vehicle's function is thoroughly assessed in order to replace the old vehicles with the most efficient and cost-effective ones. The Waste Management Officer will be responsible. | | | | | High |
| | Costs & Human Resources | Review and replace collection vehicles where required. 15m$^3$ REL approx. R2 Million; 19m$^3$ REL approx. R2.5 Million; 4Tonne Truck approx. R0.5 Million | | | | | |
| | Promote the establishment of integrated waste management infrastructure and services | Activate weighbridge at the Velddrif Transfer Stations | Continual recording of weighbridge readings and reporting to IPWIS | | | | High |
| | Costs & Human Resources | TBD | TBD | | | | |
| | Promote the establishment of integrated waste management infrastructure and services | Provide Solid Waste drop-offs at Eendekuil, Redelinghuys and Dwarskersbos | | | Continual operation and maintenance of the drop off sites and transfer stations. | | |
| | Costs & Human Resources | R9,500,000.00 | | | TBD | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Promote the establishment of integrated waste management infrastructure and services | Appoint a contractor to divert builder's rubble and organic waste from the Velddrif transfer station through chipping, crushing and beneficiating. | | | Appoint a contractor to divert builder's rubble and organic waste from the Velddrif transfer station through chipping, crushing and beneficiating. | |
| | Costs & Human Resources | R2,000,000.00 | | | TBD | |
| | Promote the establishment of integrated waste management infrastructure and services | Formally close and rehabilitate the landfills that have closure licenses. Please note that the rehabilitation cost estimates indicated below include professional fees and construction monitoring. The estimate for each site was determined for the current financial year and escalated by 6% per annum to estimate future costs. These costs must be re-evaluated annually. Closure licenses are valid for 10 years (2024) but rehabilitation works need to start within 5 years (mid 2019). | | | | Medium |
| | Costs & Human Resources | R5,3 Million (Aurora) | R31 Million (Piketberg) | R2,6 Million (Redelinghuys) | R28 Million (Porterville) | |
| | Promote the establishment of integrated waste management infrastructure and services | Vacant positions need to be filled and the Waste Department expanded in order to keep up with growth and service needs. In order to provide an effective service, key vacant positions in the solid waste department need to be filled. | | | | High |
| | Costs & Human Resources | The number of and type of position will determine the additional costs to the Municipality. Competent employees need to be appointed and training provided as necessary. | | | | |
| Strategic Objective 4: | Ensure effective and efficient waste information management | Registering of waste generators, transporters and recyclers and reporting to the Municipality. This will enable the municipality to evaluate waste management system requirements in greater detail. It will also enable a clearer indication of the amount of diversion that takes place in the Bergrivier Municipal area. The requirement of registering and reporting to the Municipality can be addressed in a revision of the solid waste by-laws. Improve data capturing at waste sites and register all sites on IPWIS and report. | | | | Medium |

| Goal 3: Effective and efficient utilisation of resources | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Objectives** | | **2018** | **2019** | **2020** | **2021** | **2022 and on** | **Priority** |
| Strategic Objective 1: | Minimise the consumption of natural resources | This also ties in with Goal 1 to promote waste minimisation and recycling, which will in turn reduce pressure on natural resources by re-using materials efficiently. New facility designs must take cognisance of natural resource protection. For example, a rehabilitated disposal site must be covered with indigenous vegetation suited to the climate so as not to require additional watering to thrive. | | | | | High |
| Strategic Objective 2: | Stimulate job creation within the waste economy | Appoint contractor(s) for recycling and RTS operations. | Assess job creation opportunities, both permanent and temporary in the waste management field and upcoming projects. Job creation remains a top need in the community. | | | | High |
| Strategic Objective 3: | Increase waste diversion through reuse, recovery and recycling | Appoint contractor(s) for recycling and RTS operations. | Continue awareness and education as per Goal 1. | | | | High |
| | Increase waste diversion through reuse, recovery and recycling | Investigate the establishment of dedicated Material Recovery Facilities, Composting sites and Builders Rubble Crushers. These facilities may be owned and operated in house but may also be shared between municipalities should the volumes required or sustainability dictate this. | | | | | |
| | Costs & Human Resources | Appointment of consultant and communication and discussions between the solid waste departments of Bergrivier and neighbouring municipalities. Estimated construction cost of composting facility is approx. R4 million | | | | | |

| Goal 4: Improved compliance with environmental regulatory framework | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Objectives** | | **2018** | **2019** | **2020** | **2021** | **2022 and on** | **Priority** |
| Strategic Objective 1: | Strengthen compliance monitoring and enforcement | Conduct internal and external compliance audits at all waste management facilities as required according to licences and legislation. Findings must be communicated to the DEADP. | | | | | High |
| | Costs & Human Resources | External auditors to be appointed. Waste management officer to conduct internal audits. Between R20,000 and R40,000 per Audit depending on the requirements. | | | | | |
| | Strengthen compliance monitoring and enforcement | Cooperate with the public and law enforcement to reduce instances of illegal dumping. Enforce legislation on perpetrators. | | | | | |
| Strategic Objective 2: | Remediate and rehabilitate contaminated land | Apply to delay landfill site decommissioning deadlines as per licences. Current licenses call for commencement of rehabilitation in 2019. | Develop and obtain approved closure and rehabilitation designs for sites issued with closure licences. Close and rehabilitate disposal sites as per approved designs. | | | | Medium |
| | Costs & Human Resources | Solid waste manager. | Specialist civil engineering consultants and Environmental assessment practitioners for application, design and construction monitoring purposes. Civil engineering contractors with specialist installers for rehabilitation construction. Latest available total cost estimate (June 2017) = R 66,5 Million excl. VAT which includes construction costs and professional fees. These cost estimates must be recalculated annually until appointments are made. | | | | |
| Strategic Objective 3: | Facilitate the development of waste policy instruments | Update and maintain integrated solid waste management by-laws. Develop waste policies with new developments and requirements in the waste management field. | | | | | Low |
| | Costs & Human Resources | Solid waste manager and his appointed consultants. R120,000 | | | | | |
| Strategic Objective 4: | Promote self/co-regulatory measures | Ties in with Goal 1. Person responsible to liaise with industry should promote the implementation of these measure e.g. through reviewing industry waste management plans. | | | | | Medium |

# 6. MONITORING AND REVIEW

## 6.1 ESTABLISHMENT OF AN IWMP MONITORING ADVISORY COMMITTEE

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 committee should consist of at least the following persons:

- The Bergrivier Waste Management Officer with assistance from the Civil Infrastructure Department's Supervisors and Foremen.
- The Bergrivier Development and Town Planning Director
- The Bergrivier Community Services Director
- The Bergrivier Municipality's appointed consultant, but only if required.

The members of the Committee, responsible for their separate tasks, will ensure that projects are followed, reported on and the IWMP and its schedule are up to date.

## 6.2 MONITORING SCHEDULE OR PROGRAMME

For the IWMP to be an effective and relevant tool and guide for integrated waste management in the Bergrivier Municipality, it will need to be monitored and reviewed. Monitoring relates to the goals and targets set out in the IWMP and whether they are being achieved or pursued. Reviewing relates to the document and the projects themselves which will require regular updates to stay up-to-date, specifically the implementation items of Section 5. The proposed implementation schedule as well as allocated budget may change at any time and these changes, if any, need to be reflected in the reviewed IWMP to avoid confusion.

The following diagram illustrates the initial review cycle when a new IWMP is developed:


The implementation of the fourth generation IWMP will start following Council approval. Apart from the continuous project implementation and goal tracking, which must be done by each individual project team as and when each project is running and report to Mr Breunissen or the designated Waste Management Officer, an annual IWMP report must be submitted along with the other Municipal annual reports and a copy sent to DEADP as well.

As per the Waste Act, the IWMP annual report must reflect the following:

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

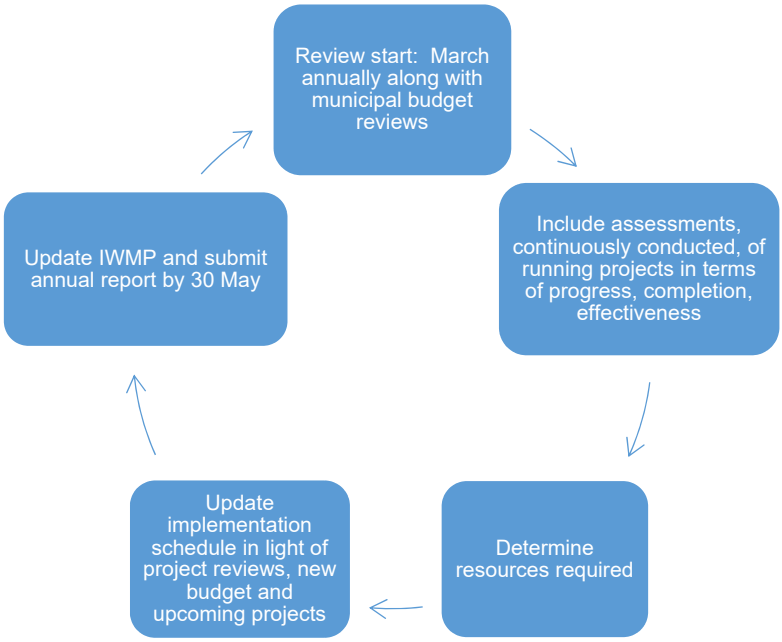

The annual implementation reports will be submitted by the Bergrivier Municipality and will be compiled by Mr Breunissen, or to whom the task is delegated by him. The annual report must contain the approved implementation items and dates of the IWMP and the progress thereof of the past year. Based on the progress and possible new budget allocations, the implementation schedule of the IWMP must be updated and included in the annual report. This new implementation schedule must provide for 3 upcoming years from the report date.

The progress of each task on the implementation schedule, if under way according to the schedule for that year, must be summarised and the estimated completion date must be updated. The reasons for the lack of progress or practical difficulties must be stated along with a summarised action plan to adhere to the schedule as close as possible. This does not infer that the implementation items themselves are only reviewed once per year. Each item and progress must be continually evaluated by the persons responsible. This will allow the information, whether a project has been completed or is on-going, to be included in the annual report and allow for the implementation schedule of the IWMP to be updated as part of the IWMP annual review process.

The report must further discuss the effectiveness of completed projects. For example, when a new weighbridge has been commissioned, the collected data must be reported on and added to the IPWIS. Also the participation rates of source separation can be monitored along with the public awareness and education campaign. The way in which projects are tracked for review are not prescribed, as long as it is done in order to measure the success of addressing the identified gaps and requirements and to identify and plan for new gaps and needs.

Wherever issues are reported or identified in the projects, these issues must also be evaluated in terms of the relevant legislation and by-laws. It must be stated if there is relevant legislation applicable to the issue and if so, was it the lack of enforcement, for example, that caused the issue. If no relevant legislation exists, it must be noted to adapt the by-laws accordingly in future revisions.

Below is the proposed review cycle and amendment procedure of the IWMP and its projects:



## 7. CONCLUSIONS AND RECOMMENDATIONS

Through this 4th generation IWMP development, the current solid waste management system of the Bergrivier Municipality has been assessed in order to determine the adequacy, shortcomings and possible improvements.

In terms of service rendering, the collection of waste in rural areas need to be maintained and improved on where possible. Transfer Station sites require improved operations and data capturing and the unused landfills require eventual closure and rehabilitation. Waste diversion needs to be continually improved upon in order to meet diversion targets.

During the process of the implementation of the municipality's IWMP, and arising from the public consultation process, further input and/or corrections to the report may come to light that will then be added as a revision to the report.

The strategic objectives for integrated waste management in Bergrivier Municipality can be summarised as follows:

- To ensure that Waste Management in the Bergrivier Municipal Area complies with South African and International environmental standards so that it is beneficial to industrial and agricultural growth and the public's right to a clean and healthy environment.
- To minimise the entrance of material of value into the waste stream.
- To reduce all waste so that nothing of value nor anything that can decompose, gets disposed.
- To store, dispose or treat all waste that cannot be avoided nor reduced at licensed facilities with regular operational and environmental monitoring and in accordance with regulatory requirements.

For these strategic objectives to be met, a series of implementation instruments (action plans) will need to be implemented. These implementation instruments as well as time framework within which it should be addressed are described in this report but need to be fully detailed at a later stage as projects are approved and acquires funding. The instruments are the following:

- Strengthened education, capacity and advocacy towards Integrated Waste Management;
- Improved integrated waste management planning and implementation for efficient waste services and infrastructure;
- Effective and efficient utilisation of resources;
- Improved compliance with environmental regulatory framework;

The above instruments, through implementation via their action plans, will ensure that waste management in Bergrivier focusses on avoidance and reduction rather than collection and disposal, but simultaneously maintaining the practical balance between the various waste management functions.

The analyses of the current waste management system has led to the identification of gaps and needs (**Chapter 4**) and these are addressed with the overarching goals and implementation (**Chapter 5**).

**Legislation & Compliance**

New integrated waste management by-laws are required. It is recommended to increase public awareness regarding legislation, especially generators of hazardous waste. It is also recommended to improve the enforcement of legislation.

All municipal waste management facilities must be audited for compliance. The municipality must then address any identified non-compliances. This is made difficult in the short term due to funding. It is recommended that planning is in place to address compliance as soon as it becomes possible.

All facilities that require licensing are licensed. It is recommended to make provision to rehabilitate the disposal facilities according to their issued licences.

**Waste Quantities & Data**

Data collection in terms of solid waste types and quantities needs to improve. It is recommended that generators of hazardous waste register and report to the municipality. Information from private recyclers also need to be obtained where applicable.

**Waste Collection, Transfer and Transport**

Collection services need to be maintained. Drop-off facilities need to be provided in all towns. Investigate the provision of additional wheelie bins.

**Waste diversion**

Waste diversion must improve in order to meet diversion targets. Recycling currently has a minimal impact on the waste stream even though recycling efforts within the municipality is operating successfully. Garden waste chipping, composting, building rubble crushing and organic waste diversion need to be investigated to add to the impact recycling is making on waste diversion from landfill. It is recommended that the municipality appoints a contractor to divert builder's rubble and organic waste from landfills through chipping, crushing and beneficiating the resultant material. The focus needs to be on the Velddrif transfer station since this facility is currently being operated in non-compliance with its waste license, which does not allow for the disposal of waste.

It is lastly recommended to start with the implementation of the 4th generation Bergrivier IWMP as soon as it is approved by Council and be included as a sectorial plan of the Bergrivier IDP. It must be regularly reviewed as per the recommended review programmes and updated as necessary.

**Organisational Needs**

A need exists for the waste management functions of the manager Civil Engineering Services to be delegated to a newly appointed position. The current Civil Engineering Services Manager has many responsibilities of which waste management is only one. With government and province rightly emphasising the importance of sustainable municipal waste management, the municipal responsibility for this function needs to be handled by a dedicated person, and thus a need exists to appoint a competent person for this function.

## 8. REFERENCES


- Government Gazette (10 March 2009). National Environmental Management: Waste Act (Act no. 59 of 2008)
- Department: Environmental Affairs & Development Planning (June 2015). Assessment Report of the 3rd Generation Integrated Waste Management Plan Bergrivier Local Municipality
- Department: Environmental Affairs (November 2011). National Waste Management Strategy
- Department: Environmental Affairs & Development Planning (March 2017). Western Cape Integrated Waste Management Plan 2017 – 2022.
- Jan Palm Consulting Engineers (February 2010). Report on Collection and Cleansing.
- JPCE (Pty) Ltd (December 2016). West Coast District Municipality Regional Site Business Case for the Bergrivier and Cederberg Regional Landfill.
- Bergrivier Municipality (2017). 4th Generation Integrated Development Plan for 1 July 2017 – 30 June 2022
- Department: Environmental Affairs & Development Planning (March 2014). Western Cape Provincial Spatial Development Framework
- PwC (March 2014). Western Cape Population Projections 2011 – 2040
- National Planning Commission. Executive Summary of the National Development Plan 2030
- Selected information from the West Coast District Municipal website
- Statistics South Africa. Census 2011
- Bergrivier Municipality (2012-2017). Bergrivier Municipal Spatial Development Framework
- Western Cape Government. Green is Smart; Western Cape Green Economy Strategy Framework 2013
- Western Cape Government. Provincial Strategic Plan 2014 – 2019.
- Western Cape Government. OneCape 2040.

# ANNEXURE A

# BERGRIVIER SOLID WASTE BY-LAWS

(a) a fine or imprisonment, or either such fine or imprisonment or to both such fine and such imprisonment and,

(b) in the case of a continuing offence, to an additional fine or an additional period of imprisonment or to such additional imprisonment without the option of a fine or to both such additional fine and imprisonment for each day on which such offence is continued and,

(c) a further amount equal to any costs and expenses found by the court to have been incurred by the municipality as result of such contravention or failure.

**45. Conflict with other legislation**

In the event of any conflict between any provision of this by-law and National and

Provincial legislation, standards, policies or guidelines, the National and Provincial legislation, standards, policies or guidelines shall prevail.

**46. Repeal of by-laws**

The provisions of any by-laws previously promulgated by the municipality or by any of the disestablished municipalities now incorporated in the municipality, are hereby repealed as far as they relate to matters provided for in this by-law, and insofar as it has been made applicable to the municipality by the authorisation for the execution of powers and functions in terms of section 84(3) of the Local Government: Municipal Structures Act, Act 117 of 1998.

**47. Short title and commencement**

This by-law shall be known as the By-law relating to Roads and Streets and shall come into operation on the date of publication thereof in the Provincial Gazette.



## BERGRIVIER MUNICIPALITY

## SOLID WASTE DISPOSAL BY-LAW

Under of section 156 of the Constitution of the Republic of South Africa, 1996 (Act 108 of 1996), the Bergrivier Municipality, enacts as follows:—

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**1. Definitions**

In this By-law, unless the context otherwise indicates—

**"attendant"**, means an employee of the municipality or agent of the municipality duly authorised to be in charge of the disposal site;

**"disposal site"** means a site used for the accumulation of waste with the purpose of disposing or treatment of such waste and includes a waste transfer and recycling station;

**"municipality"** means the Municipality of Bergrivier established in terms of Section 12 of the Municipal Structures Act, 117 of 1998, and includes any political structure, political office bearer, councillor, duly authorised agent or any employee acting in connection with this by-law by virtue of a power vested in the municipality and delegated or sub-delegated to such political structure, political office bearer, councillor, agent or employee;

**"owner"** also means lessee, occupier, resident or any person who obtains a benefit from the premises or is entitled thereto and also includes any insolvent estate, executor, administrator, trustee, liquidator judicial manager;

**"premises"** means residential-, business-, and industrial premises and includes any land, whether vacant, occupied or with buildings thereon, forming part of a piece of land laid out as a township, irrespective of being proclaimed as a township;

**"removal day"** means the day fixed by the municipality for removal of waste from premises and depending on the case may be multiple removals per week;

**"waste"** includes—

(a) "business waste" which means any matter or substance arising out of the use of business premises but does not include, hazardous waste, material, domestic waste or garden waste;

(b) "domestic waste" which means any fruit or vegetable peels, fruit or vegetable waste, general domestic waste as well as garden waste which is of such size that it may be deposited in a refuse bin;

(c) "garden waste" which means waste originating from a gardening activity such as grass cutting, leaves, plants flowers or similar waste of such size that it can be placed in a refuse bin;

(d) "hazardous waste" which means any waste, matter or substance which may be hazardous or harmful to the environment and residents or which may pollute the environment including asbestos, motor oils or lubricants, or any other waste, matter or substance which constitutes hazardous waste as envisaged in the Hazardous Substances Act, 1973, Act 15 of 1973;

(e) "offensive waste" means any waste, matter or substance which may be harmful to the environment and residents and includes, but is not limited to—

(i) animal products, animal carcasses and meat as defined in the Meat Safety Act, (Act 40 of 2000) and in the Red Meat Regulations promulgated under GN 1072 of 17 September 2004;

(ii) fruit or vegetables or any by-product obtained from such fruit or vegetables;

(iii) perishable foodstuffs; and

(iv) health care waste as defined in the Western Cape Health Care Waste Management Act, 2007, (Act 7 of 2007).;

(f) "materials" which means any stone, rock, sand, building materials or building rubble or any other type of composite or artificial materials such as plastic pipes and similar materials as well as materials which are utilised in the erection of buildings or structures or any other materials which constitute materials;

**"waste bin"** means a mobile container with a capacity determined by the municipality, or alternatively plastic bags, which the municipality may make available to each premises;

**"waste management activities"** means the generation, reduction and minimisation of waste, waste handling, which includes the separation, storage, collection, and transfer of waste, and waste treatment, which includes the recovery of waste, recovery being the recycling, reclamation and re-use of waste, and disposal of waste, and any word to which a meaning has been assigned in the Environment Conservation Act, 1989 (Act 73 of 1989) and in the Directions with regard to the Control and Management of General Communal and General Small Waste Disposal Sites issued under the Act and published per GN R91 in Government Gazette No. 23053 dated 1st February 2002, bears that meaning.

**"waste transfer and recycling station"** means a waste handling facility that receives and temporarily stores waste or any recyclable waste, or a combination thereof.

**2. Purpose of by-laws**

This by-law strive to promote the achievement of a safe and healthy environment for the benefit of residents within the area of jurisdiction of the municipality, and to provide for procedures, methods and practices to promote waste management activities such as, but not limited to, the dumping of waste and the management of solid waste disposal sites.

**3. Applicable legislation**

The Directions in terms of section 20(5)(b) of the Environment Conservation Act, 1989 (Act 73 of 1989) with regard to the Control and Management of General Communal and General Small Waste Disposal Sites as published in GN 91 in GG 23053 of 1 February 2002 apply.

**4. Duties and powers of municipality**

(1) The municipality as the primary service provider in the municipal area has a duty to the local community to progressively ensure efficient, affordable, economical and sustainable access to waste management services in its area or a part of its area.

(2) This duty is subject to—

(a) the duty of members of the local community as users of the municipality's waste management services or any other person making use of the municipality's waste management services to pay for the provision of the services, the prescribed charges, which must be priced in accordance with any nationally prescribed norms and standards for rates and tariffs; and

(b) the right of the municipality to differentiate between geographical areas when providing types of waste management services, without compromising on service equity in line with the Constitution.

(3) The municipality must as far as is reasonably possible and subject to the provisions of this by-law provide, at a cost to users of the services prescribed by the municipality—

(a) for the collection of waste on a regular basis, except waste in its area, which is so situated that the cost of collecting it would be unreasonably high; and

(b) access to facilities for the recovery and disposal of waste.

(4) The municipality must notify all users of its waste management services of any decisions taken in terms of this By-law.

**5. Compulsory use of service**

(1) No one except the municipality or a person authorised by the municipality may remove any refuse from any premises or dispose thereof.

(2) Each owner of premises must make use of the service provided by the municipality for the removal or disposal of refuse, in respect of refuse originating from such premises.

(3) The tariff as fixed by the municipality shall be payable to the municipality by the owner, irrespective whether the service is being used, or not.

(4) The provisions of this section do not apply to an owner of residential premises who occasionally wishes to dispose of garden refuse generated on such premises.

(5) A person who contravenes the provisions of subsections (1) and (2) commits an offence.

**6. Establishment and control of disposal site**

The municipality may establish and control a disposal site, or may appoint agents or may contract some other person or body to control, manage and operate a disposal site on behalf of the municipality in accordance with the provisions of this by-law and the provisions of any other legislation that may be applicable.

**7. Access to disposal site**

(1) Only a person wishing to dump waste who has paid the prescribed fees or who is in possession of a written permission issued by the municipality which permits him or her to dump such waste at a disposal site and a person having obtained the written consent of the municipality to recycle any materials or objects on such a site, is entitled to enter the disposal site or to be on the site.

(2) Notwithstanding anything to the contrary contained in this by-law, any employee of the municipality or anybody acting on behalf of the municipality and duly authorised thereto, may enter a disposal site at any time in exercising his or her duties.

(3) A person making use of the disposal site or entering the disposal site, do so at his or her own risk and the municipality accepts no responsibility for the safety of such person or any damages or losses sustained by such person.

(4) A person who enters a disposal site or who is found on such a site in contravention of the provisions of this section commits an offence.

**8. Off-loading of waste**

(1) A person who wishes to dump waste at a disposal site, must off-load such waste at such a place within the borders of the disposal site and in such a manner as the attendant may direct.

(2) The municipality may—

(a) set aside any part of a disposal site where only waste of a particular kind may be dumped or deposited.

(b) limit the type or size of vehicle from which waste may be dumped or deposited at any disposal site.

(c) limit the quantity of waste in general or the quantity of a particular type of waste which may be dumped or deposited at any disposal site.

(d) the days when and hours during which dumping may take place at any disposal site.

(3) Any requirement imposed in terms of this by-law must be indicated to the public by means of an appropriate notice erected at the entrance of the disposal site concerned and any instruction issued by an official of the municipality or a person acting on behalf of the municipality in charge of access control at the dumping site, shall be strictly complied with.

(4) Notwithstanding the provisions of subsection (2) the municipality reserves the right not to permit the dumping of hazardous or offensive waste at a disposal site.

(5) A person who contravenes any of the provisions of this section commits an offence.

**9. Ownership of waste**

(1) Waste dumped at a disposal site, becomes the property of the municipality and no person who is not duly authorised by the municipality to do so may remove or interfere with such waste.

(2) A person who contravenes subsection (1) commits and offence.

**10. Categories of waste**

The municipality may, for the purposes of this by-law, categorise waste into different categories.

**11. Separation of waste for recycling purposes**

The municipality may require that waste be separated into different kinds and nature of waste for the purposes of recycling or for any other purpose in terms of this by-law.

**12. Provision of waste bins**

(1) The municipality may—

(a) provide waste bins, or alternatively plastic bags, for the disposal of waste generated on premises; and

(b) authorise the use of bins and lids constructed of rubber or other material where the design and construction has been approved by the municipality.

(2) Waste bins other than plastic bags provided in terms of subsection (1) remain the property of the municipality.

(3) The municipality may prescribe special waste bins for the reception and storage of such types of waste as the municipality may specify and may by written notice on the owner of premises require the owner to provide at his or her own expense such number of special waste bins as are specified in the notice.

(4) Where any waste bin provided on premises is—

(a) of a size likely to hinder the efficient removal of waste there from by employees of the municipality;

(b) is insufficient for the reception of all waste which is to be removed from such premises by the municipality;

(c) dilapidated; or

(d) likely to cause a nuisance,

the municipality may by notice, require the owner of the premises to provide, at his or her own expense, an additional number of waste bins or such other means of storing receptacles as may be necessary to comply with the provisions of this by-law.

(5) A waste bin shall be replaced as and when it is necessary, provided that where such waste bin has to he replaced as a result of theft or damage caused through the negligence of the owner, such owner shall be held liable for the cost of replacing it.

(6) No person may dispose of any waste by placing it anywhere else than in a waste bin provided or approved by the municipality.

(7) In respect of a group development the municipality may provide less waste bins per household subject to the following conditions—

(a) a central refuse collection point must be provided by the managing body;

(b) the managing body must apply in writing for the reduction of waste bins issued to the development;

(c) the reduced number of bins must be approved by the municipality; and

(d) the managing body shall be held liable for payment of the account for waste removal.

(8) A person who contravenes a provision of subsection (6) or who fails to comply with a notice issued in terms of subsections (3) and (4) commits an offence.

**13. Location of waste bins**

(1) The owner of premises must provide adequate space on the premises where a waste bin or other receptacle for the purpose of depositing waste or a specific category of waste are kept, and the space must—

(a) comply with requirements imposed by the municipality by notice to the owner;

(b) where applicable, be constructed in accordance with the requirements of any applicable building regulations and be so located that the waste bin or receptacle is not visible from a street or public place;

(c) where applicable, be so located as to permit convenient access to and egress from such place for a waste collection vehicle; and

(d) be in a location convenient for the use by users or occupants of the premises so as to discourage littering or the unhealthy accumulation of waste.

(2) In the case of multi-storey buildings, the municipality may approve the installation of refuse chutes of an approved design and specification, and subject to the submission and approval of the plans for such installation.

(3) The owner of premises must place or cause the waste bins to be placed in the space provided and must at all times keep it there.

(4) A person who contravenes a provision of subsection (1) or (3) commits an offence.

**14. Maintenance of waste bins**

(1) The occupier of premises must ensure that a waste bin other than plastic bags is—

(a) at all times maintained in good order and repair;

(b) emptied and cleansed when full, so that its contents do not become a nuisance or provide grounds for complaint;

(c) protected against unauthorised disturbance or interference at all times when waste is not being deposited into it or discharged from it.

(2) No person may remove a waste bin from any premises to which it has been allocated or destroy or damage it, or permit it to be removed, destroyed or damaged.

(3) A person who contravenes any provision of this section commits an offence.

**15. Collection of waste**

(1) The municipality may indicate a position within or outside the premises where waste bins must be placed for the collection and removal thereof and may require certain kinds of waste, such as garden waste, to be bundled or packaged and be placed in that position at the times and for a period as the municipality may require.

(2) The municipality shall on removal days collect only waste placed in waste bins or other containers approved by it or which is bundled or packaged in a manner approved by the municipality.

(3) Where a particular kind of waste as stipulated by the municipality is not collected by the municipality from premises, the owner of the waste must arrange for the collection and transport of the waste as often as may be necessary to prevent undue accumulation or any nuisance arising there from, to a waste disposal or processing site under the control of the municipality, or to such other place as may be approved by the municipality.

(4) The municipality may decide on separate times on which particular categories of waste are to be collected.

(5) The municipality may—

(a) cause collections to be made at regular periods daily or otherwise, and may alter dates of collection;

(b) increase the number of collections as it may deem necessary or desirable; or

(c) make additional collections should it be desirable.

(6) In the event of any additional collection being required by the owner of premises, the additional collection will be subject to the approval of the municipality and each additional collection must be paid for by the owner of premises from which the waste is collected at the tariff prescribed by the municipality.

(7) The municipality may, upon application by the owner of premises, approve alternative arrangements for removal of waste from such premises.

(8) A person who contravenes the provisions of section (1) or (3) commits an offence.

**16. Access to premises**

Except where otherwise approved by the municipality, the owner of premises must ensure that access from the nearest public road to the waste storage area on a premises is independent and unimpeded, and an owner who fails to do so, commits an offence.

**17. Right of entry**

(1) Any duly authorised employee of the municipality is entitled to enter premises in respect of which the municipality's waste management services are rendered at any reasonable time on any day, or at any other time at which the service is ordinarily rendered for any of the following purposes:

(a) for collecting and supervising the collection of waste;

(b) for replacing waste bins; or

(c) for inspecting the means of access to the premises, or the space where waste bins are kept so as to ensure that they are accessible and convenient for the collectors.

(2) The owner of the premises may not refuse access to the premises by an employee of the municipality.

(3) An owner of premises commits an offence if he or she—

(a) denies access to the premises to an authorised employee of the municipality in the performance of his or her duties; or

(b) obstructs or impedes such employee of the municipality in the performance of his or her duties.

**18. Dumping and littering**

(1) No person may—

(a) except by permission of the owner or of the person or authority having control thereof; or

(b) unless authorised by law to do so, dump, accumulate, place, deposit or leave any waste whatsoever, whether for gain or otherwise, or cause or allow to be dumped, accumulated, placed, deposited or left such waste on or in—

(i) any road, highway, street, lane, public footway or pavement or any road verge;

(ii) any commonage land, village green, park, recreation ground or other open space to which the public have access;

(iii) any drain, watercourse, flood prone areas, tidal or other water in or abutting on any such road, highway, street, lane, public footway or pavement, roadside or other open space to which the public have access; or

(iv) private or municipal land,

(2) Should a person do any of the acts contemplated in subsection (1), the municipality may by written notice require any of the following persons to dispose of, destroy or remove the waste within the period stated in the notice:

(a) the person directly or indirectly responsible for dumping, accumulating, placing, depositing, or leaving the waste;

(b) the owner of the waste, whether or not he is responsible for dumping, accumulating, placing, depositing, or leaving the waste; or

(c) the owner of the premises on which the waste was dumped, accumulated, placed, deposited, or left, whether or not he or she is responsible therefor.

(3) If a person fails to comply with the requirements of a written notice, the municipality may dispose of, destroy or remove the waste and may recover the cost of doing so from the person or persons to whom the notice was issued.

(4) If waste has been deposited in or on any land in contravention of subsection (1) and–

(a) in order to remove or prevent pollution of land, water or air or harm to human health, it is necessary that the waste be forthwith removed or other steps taken to eliminate or reduce the consequences of the deposit or both; and

(b) there is no occupier of the land; or

(c) the owner neither made nor knowingly permitted the deposit of the waste, the municipality may remove the waste or take other steps to eliminate or reduce the consequences of the deposit and is entitled to recover the cost incurred by it—

(i) from the owner of the land unless he or she proves that he or she neither made nor knowingly caused nor knowingly permitted the deposit of the waste; or

(ii) from any person who deposited or knowingly caused or knowingly permitted the deposit of any of the waste.

(5) Any waste removed by the municipality belongs to the municipality and may be dealt with as the municipality deems fit.

(6) A person who contravenes a provision of subsection (1) commits an offence.

**19. Burning of waste**

No person may burn waste without the written approval of the municipality.

**20. Charges**

(1) The municipality may fix the charges payable to it for the removal of waste from premises or the dumping of waste at a disposal site under the control of the municipality.

(2) A person who fails or refuses to pay the charges contemplated in subsection (1) commits an offence.

**21. Exemptions**

(1) A person may by means of a written application, in which the reasons are given in full, apply to the municipality for exemption from any provision of this by-law.

(2) The municipality may—

(a) grant an exemption in writing and the conditions in terms of which, if any, and the period for which such exemption is granted must be stipulated therein;

(b) alter or cancel any exemption or condition in an exemption; or

(c) refuse to grant an exemption.

(3) An exemption does not take effect before the applicant has undertaken in writing to comply with all conditions imposed by the municipality under subsection (2), however, if an activity is commenced before such undertaking has been submitted to the municipality, the exemption lapses.

(4) If any condition of an exemption is not complied with, the exemption lapses immediately.

**22. Liaison forums in community**

(1) The municipality may establish one or more liaison forums in a community for the purposes of—

(a) creating conditions for a local community to participate in the affairs of the municipality; and

(b) promoting the waste management activities of the municipality.

(2) A liaison forum may consist of—

(a) a member of members of an interest group, or an affected person, in the spirit of section 2(4)(f)–(h) of the National Environmental Management Act, 1998 (Act 107 of 1998);

(b) a member or members of a community in whose immediate area a solid waste disposal site exists or may come be established;

(c) a designated official or officials of the municipality;

(d) a councillor; and

(e) such other person or persons the municipality may decide on.

(3) (a) The municipality may, when considering an application for consent, permit or exemption certificate in terms of this by-law, where applicable, request the input of a liaison forum.

(b) A liaison forum, person or persons contemplated in subsection (2), or any other person may, on own initiative, having regard to the provisions of section 31 of the National Environmental Management Act, 1998, submit an input to the municipality for consideration.

**23. Authentication and service of order, notice or other document**

(1) An order, notice or other document requiring authentication by the municipality must be sufficiently signed by the Municipal Manager shall be deemed to be duly issued if it is signed by the Municipal Manager.

(2) Any notice or other document that is served on a person in terms of this by-law is regarded as having been served—

(a) when it has been delivered to that person personally;

(b) when it has been left at that person's place of residence or business in the Republic with a person apparently over the age of sixteen years;

(c) when it has been posted by registered or certified mail to that person's last know residential or business address in the Republic and an acknowledgment of the posting thereof from the postal service is obtained;

(d) if that person's address in the Republic is unknown, when it has been served on that person's agent or representative in the Republic in the manner provided by paragraphs (a), (b) or (c);

(e) if that person's address and agent or representative in the Republic is unknown, when it has been posted in a conspicuous place on the property or premises, if any, to which it relates; or

(f) in the event of a body corporate, when it has been delivered at the registered office of the business premises of such body corporate.

(3) Service of a copy shall be deemed to be service of the original.

(4) Any legal process is effectively and sufficiently served on the municipality when it is delivered to the municipal manager or a person in attendance at the municipal manager's office.

**24. Appeal**

A person whose rights are affected by a decision of the municipality may appeal against that decision by giving written notice of the appeal and the reasons therefor in terms of section 62 of the Local Government: Municipal Systems Act, Act 32 of 2000 to the municipal manager within 21 days of the date of the notification of the decision.

**25. Penalties**

A person who has committed an offence in terms of this by-law is liable upon conviction to a fine or imprisonment, or either such fine or imprisonment or to both such fine and such imprisonment and, in the case of a continuing offence, to an additional fine or an additional period of imprisonment or to such additional imprisonment without the option of a fine or to both such additional fine and imprisonment for each day on which such offence is continued and, a further amount equal to any costs and expenses found by the court to have been incurred by the municipality as result of such contravention or failure.

**26. Conflict with other legislation**

In the event of any conflict between any provision of this by-law and National and

Provincial legislation, standards, policies or guidelines, the National and Provincial legislation, standards, policies or guidelines shall prevail.

**27. Revocation of by-laws**

The provisions of any by-laws previously promulgated by the municipality or by any of the disestablished municipalities now incorporated in the municipality, are hereby repealed as far as they relate to matters provided for in this by-law, and insofar as it has been made applicable to the municipality by the authorisation for the execution of powers and functions in terms of section 84(3) of the Local Government: Municipal Structures Act, Act 117 of 1998.

**28. Short title and commencement**

This by-law shall be known as the Solid Waste Disposal By-law, and commences on the date of publication thereof in the Provincial Gazette.

# ANNEXURE B

# 3RD GENERATION IWMP EVALUATION REPORT

Western Cape Government
Environmental Affairs & Development Planning

# Assessment Report of the 3rd Generation Integrated Waste Management Plan

## Bergrivier Local Municipality

## June 2015

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## 1. INTRODUCTION AND GENERAL DESCRIPTION

The draft Integrated Waste Management Plan (IWMP) report provides a clear description of the purpose and scope of the IWMP. The recommendations highlighted in the 2nd generation IWMP assessment report have also been included in the draft IWMP report as well as how these have been addressed. It is mentioned under the general description (section 1.3) that the Bergrivier area hosts many industries including the agricultural and fisheries, which appear to be the lead sectors as well as tourism which is indicated to be a fast growing industry.

## 2. STRATEGIC LINKAGES

The draft IWMP report provides linkages between national, provincial and municipal goals and objectives; however the Provincial Spatial Development Framework (PSDF, March 2014) has not been included in the strategic linkages table (section 1.6). This could be due to the fact that at the time the PSDF was finalised, the draft IWMP report was in the process of being finalised for comment by the Municipality.

## 3. PUBLIC PARTICIPATION

It is indicated in the draft IWMP report that the public will be informed about the report through advertisements in local newspapers and will be available at public libraries as well as the consultant's website (www.jpce.co.za). The draft IWMP report must be placed on the Bergrivier Municipality's website (www.bergmun.org.za) as well.

## 4. IWMP STATUS QUO OR SITUATIONAL ANALYSIS

### 4.1 Legislative Framework Governing Waste Management

The draft IWMP report outlines National and Provincial legislation as well as municipal by-laws pertaining to waste management. It is indicated that the Municipality has no plans in place to revise the current by-laws, however, it is recommended in the report that the Municipality should review and update the Solid Waste by-law into an Integrated Waste Management by-law. The Department of Environmental Affairs and Development Planning (DEADP) is in the process of drafting a model Integrated Waste Management by-law, which can be used to review existing by-laws or can be adopted by municipalities. The PSDF (March, 2014) has been finalised and must be included in the

final IWMP report as indicated in the draft report. The DEADP recommends that the background policy and legislation section (2) be drafted in a chronological order.

### 4.2 Demographic Profile

The draft IWMP report provides the current population statistics and highlights the main industries existing within the Municipality. The draft report also makes reference to road infrastructure and indicates that only two towns have rural roads and require proper infrastructure (Aurora and Redelinghuys, section 1.5). The Municipality can use the DEADP: Growth Potential Study (GPS) of Towns (March, 2014) to identify the development profile of the municipal area in relation to its towns as well as the District Municipality as a whole. The Growth Potential index of the towns as well as the Bergrivier Municipality has been identified in the study for example; Aurora - Goedverwacht – Redelinghuys have been identified as having a medium Growth Potential index at municipal level but low at the settlement (town) levels; Dwarskersbos - Eendekuil - Piketberg – Velddrift have been identified as having a medium Growth Potential index at both municipal and settlement (town) and Porterville has been identified as having a high Growth Potential index at settlement level but medium index at the municipal (GPS, March 2014).

### 4.3 Waste Management Cost and Financing

The draft IWMP report provides the capital and operating budget as well as expenditure for the Municipality. The report also provides the income and tariff structure.

### 4.4 Services and service delivery

The draft IWMP report indicates that there are no informal settlements in Bergrivier. However, the Bergrivier Municipality's Human Settlements Plan (September, 2013) indicates that the Municipality does not have large informal settlements. This implies that informal settlements do exist but not in large numbers; unless housing has been provided between October 2013 and August 2014 when this draft report was completed.

According to the Local Government Basic and Free Basic Services, as of December 2014 (February, 2015 report), the total number of households in the Municipality was 8 882; with 7 086 formal households, 90 informal households as well as 1 706 indigent households

and all households receive a refuse removal service. Clarity is required with regards to the status of informal settlements within the Municipality. According to the draft IWMP report, based on a 2013/ 2014 Annual Report, 2 208 indigent households received a 100% refuse removal service.

The Local Government stats indicate that as at December 2014 all households within the Municipality received a refuse removal service, however, the draft IWMP report indicates that the Municipality does not provide a refuse removal service to farms and rural households due to transportation distances. The draft report indicates that farmers take their waste to the drop-offs or transfer stations but there is no indication if the rural households do the same. Residential households receive two black bags per collection week and clear bags are used for mixed recyclables, which are collected separately as well as green bags for garden waste, which is collected on request.

**4.5 Compliance & Enforcement: Licensing**

According to the draft IWMP report, none of the Waste Disposal Facilities (WDFs) within the Bergrivier Municipality are operational or licensed. The waste is sent to the Piketberg or Velddrif transfer stations (both licenced for 10 years) and then transported for disposal to the Vredenburg or Highlands WDFs in agreement with the Saldanha Bay and Swartland Municipality respectively. It is recommended in the draft report that the Municipality needs to make provision for external auditing of the transfer stations. There are drop-off facilities in Aurora and Porterville (no licence is required), which receive general waste that is then transported to the Velddrif and Piketberg transfer stations respectively. The Municipality is in the process of applying for closure licenses for the closed WDFs; however it is indicated in the draft report that the sites cannot be rehabilitated due to budget constraints even though the costing for rehabilitation has been conducted. The Municipality is in the process of formalising the salvaging that takes place at the transfer stations. The Municipality is currently in discussions with PPC with regards to their plant accepting waste tyres, garden waste and household waste for use as fuel (waste treatment option).

### 4.6 Waste characterisation and projections

The draft IWMP report uses weighbridge data and population stats to estimate general waste volumes for the Municipality; however, the data excludes quantities for waste from rural areas, builder's rubble and green waste. A load estimation method was used for these waste types but not enough detail has been provided regarding the method in the draft report. A hazardous waste survey was conducted to determine the hazardous waste quantities generated (annually) by business and industry within the Municipality as well as how the waste types are handled and managed. The survey provides a type of classification of the waste (not the National Waste Classification System, although the SANS 0228 classification is also included).

### 4.7 Waste minimisation

The draft IWMP report provides an estimated percentage (8%) for the waste diverted within the municipal area. The Municipality implements a source separation initiative and private contractors are currently appointed for recycling activities at the transfer stations and the Municipality intends to formalise salvaging.

### 4.8 Organisational Structure and Staff capacity

An organogram has been included in the draft IWMP report.

### 4.9 Waste Awareness and education

The Municipality uses pamphlets to disseminate waste related information to the residents within the municipal area. It is indicated in the draft report that Municipality is expecting support from the DEADP with respect to the Youth Jobs in Waste programme. However, this programme is funded by DEA not the DEADP.

### 4.10 Waste Information Management

The Bergrivier Municipality is registered and reports onto the Integrated Pollutant and Waste Information System (IPWIS) according to the draft report. The Municipality is using the Waste Calculator and also has accurate disposal quantities from the WDFs it utilises for disposal.

## 5. GAP/ NEED IDENTIFICATION

The draft IWMP report identifies existing waste management problems or gaps within the Bergrivier Municipality.

## 6. GOALS, OBJECTIVES AND TARGETS

The draft IWMP report provides strategic objectives that focus on high level concepts as well as more specific objectives (in the implementation plan) that address the identified gaps within the Bergrivier Municipality.

## 7. IMPLEMENTATION

The implementation plan provides some detail with regard to the actions the Municipality needs to take to address the identified gaps. It also provides the timeframes for the execution of the activities as well as the responsibility for human and financial resources required for the implementation. The draft report indicates the projects or actions that are budget for within the IDP as well as those that still need to be included in the IDP.

## 8. MONITORING AND REVIEW

The draft IWMP report provides a template of a project review form that can be used by the Municipality to track project progress and then add on to the annual reports. Regular project meetings need to be held to ensure that projects are still on path and if not then action can be taken timeously to implement corrective measures.

## 9. IWMP CHECKLIST SCORE

| SECTION | SCORE |
|---|---|
| 1. Introduction and general description | 3/3 |
| 2. Strategic Linkages | 3/3 |
| 3. Public participation | 1/1 |
| 4. IWMP Status quo or Situation analysis | **31/32** |
| 4.1 Legislation | 2/2 |
| 4.2 Demographics | 4/5 |
| 4.3 Waste management cost and financing | 3/3 |
| 4.4 Services and service delivery | 4/4 |
| 4.5 Compliance and Enforcement | 5/5 |
| 4.6 Waste characterisation | 6/6 |
| 4.7 Waste minimisation | 2/2 |
| 4.8 Organisational structure and staff capacity | 2/2 |
| 4.9 Waste awareness and education | 1/1 |
| 4.10 Waste information management | 2/2 |
| 5. Gap and need analysis | 1/1 |
| 6. IWMP Objectives targets | 1/1 |
| 7. IWMP Implementation | 2/2 |
| 8. Monitoring and review | 1/1 |
| **Total** | **43/44** |

The IMWP submitted for review fulfilled 97.7% of the requirements of an IWMP. The DEADP can be contacted via telephone (021) 483 2712; contact person is August Hoon or Dean Gilbert; email August.Hoon@westerncape.gov.za or Dean.Gilbert@westerncape.gov.za for further clarity.

## 10. CONCLUSIONS AND RECOMMENDATIONS

- The Municipality needs to verify the hazardous waste data obtained from the survey via the IPWIS.
- The Municipality needs to provide clarity with respect to the management of waste from rural areas and whether a waste contractor is used to collect waste in rural villages.
- The Bergrivier draft IWMP report addresses most of the requirements of NEMWA.

# ANNEXURE C

# HAZARDOUS WASTE SURVEY

# BERGRIVIER MUNICIPALITY

## HAZARDOUS WASTE SURVEY

**Completed by:**

**Aquila Environmental (Pty) Ltd**
**Waste Management Consultants**
28a Sir George Grey Street
Cape Town, 8001
Tel: (072) 448 2992
E-mail: cmcronje13@gmail.com

## OCTOBER 2018

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# Introduction

Aquila Environmental (Pty) Ltd was appointed by JPCE (Pty) Ltd to conduct a Hazardous Waste Survey (HWS) within the Bergrivier Municipal Area. JPCE was appointed by the Bergrivier Municipality to develop the fourth generation Integrated Waste Management Plan (IWMP) according to the National Environmental Management: Waste Act of 2008 and requirements as stipulated by the Department: Environmental Affairs and Development Planning.

Aquila Environmental's scope included the identification of industrial waste, hazardous waste and health care risk waste generators as well as acquiring the available information of these waste types from the generators such as the volumes generated, treatment methods, transport methods, transporters and final disposal.

## Legislative context for Hazardous Waste in South Africa.

**1. The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)**

The first waste specific legislation published in South Africa was the National Environmental Management: Waste Act (NEM:WA). It provided the mechanism to regulate the waste value chain aiming to minimise adverse effects on human health and the environment. The National Department of Environmental Affairs (DEA) is the regulatory body for the licensing of Hazardous Waste Facilities, according to NEM:WA's Chapter 5. In addition, the management of hazardous waste is included in the concurrent legislative competence of both National and Provincial Government assigned by the South African Constitution with respect to environment and pollution control.

**2. The National Environmental Management: Waste Amendment Act, 2014 (Act No. 26 of 2014)**

On 02 June 2014 an amendment of Section 1 of the NEM:WA, as amended by the National Environmental Management: Waste Amendment Act (NEM:WAA), was enacted whereby "Schedule 3: Defined Wastes" was inserted. This Schedule is divided into Category A: Hazardous Waste and Category B: General Waste. The purpose of this Schedule is to define all types of waste and to categorise them in order to assist with the identification of wastes. Schedule 3 defines Hazardous Waste as follows:

> *"'Hazardous waste' means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles."*

Schedule 3 of NEM:WA was used to determine the various industrial groups potentially generating hazardous waste.

*Table 1: Industries identified for the HWS*

| Industrial Group | Industrial Process | Potential generator identified in study area? | Hazardous waste actually generated at potential generator? |
|---|---|---|---|
| 1. **Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food** | (a) hazardous portion of wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing | YES | YES |

| | | | | |
|---|---|---|---|---|
| | **preparation and processing** | | | |
| 2. | **Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard** | (a) hazardous portion of wastes from wood processing and the production of panels and furniture<br><br>(b) hazardous portion of wastes from wood preservation<br><br>(c) hazardous portion of wastes from pulp, paper and cardboard production and processing | YES | NO |
| 3. | **Wastes from the leather, fur and textile industries** | (a) hazardous portion of wastes from the leather<br>and fur industry<br><br>(b) hazardous portion of wastes from the textile industry | YES | NO |
| 4. | **Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal** | (a) wastes from petroleum refining<br><br>(b) wastes from the pyrolytic treatment of coal<br><br>(c) wastes from natural gas purification and transportation | NO | N/A |
| 5. | **Wastes from inorganic chemical processes** | (a) wastes from the manufacture, formulation, supply and use (MFSU) of acids<br><br>(b) wastes from the MFSU of bases<br><br>(c) wastes from the MFSU of salts and their solutions and metallic oxides<br><br>(d) metal-containing wastes<br><br>(e) wastes from the MFSU of sulphur chemicals, sulphur chemical processes and desulphurisation processes<br><br>(f) wastes from the MFSU of halogens and halogen chemical processes<br><br>(g) wastes from the MFSU of silicon and silicon derivatives<br><br>(h) wastes from the MSFU of phosphorous chemicals and phosphorous chemical processes<br><br>(i) wastes from the MFSU of nitrogen chemicals, nitrogen chemical processes and fertiliser manufacture<br><br>(j) wastes from the manufacture of inorganic pigments | YES | NO |

| | | | |
|---|---|---|---|
| | (k) other wastes from inorganic chemical processes | | |
| 6. **Wastes from organic chemical processes** | (a) wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals<br><br>(b) wastes from the MFSU of plastics, synthetic rubber and man-made fibres<br><br>(c) wastes from the MFSU of organic dyes and pigments<br><br>(d) wastes from the MFSU of organic plant protection products, wood preserving agents and other biocides<br><br>(e) wastes from the MFSU of pharmaceuticals<br><br>(f) wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics<br><br>(g) other wastes from the MFSU of fine chemicals and chemical products | NO | N/A |
| 7. **Wastes from thermal processes** | (a) hazardous portion of wastes from power stations and other combustion plants<br><br>(b) hazardous portion of wastes from the iron and steel industry<br><br>(c) wastes from aluminium thermal metallurgy<br><br>(d) wastes from lead thermal metallurgy<br><br>(e) wastes from zinc thermal metallurgy<br><br>(f) wastes from copper thermal metallurgy<br><br>(g) wastes from silver, gold and platinum thermal metallurgy<br><br>(h) wastes from other non-ferrous thermal metallurgy<br><br>(i) hazardous portion of wastes from casting of ferrous pieces<br><br>(j) hazardous portion of wastes from casting of non-ferrous pieces | YES | YES |

| | | | |
|---|---|---|---|
| | (k) hazardous portion of wastes from manufacture of glass and glass products<br><br>(l) hazardous portion of wastes from manufacture of ceramic goods, bricks, tiles and construction products<br><br>(m) hazardous portion of wastes from manufacture of cement, lime and plaster and articles and products made from them | | |
| 8. **Waste from the photographic industry** | (a) hazardous portion of waste from the photo- graphic industry | NO | N/A |
| 9. **Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks** | (a) wastes from MFSU and removal of paint and varnish<br><br>(b) wastes from MFSU of other coatings (including ceramic materials)<br><br>(c) wastes from MFSU of printing inks<br><br>(d) wastes from MFSU of adhesives and sealants<br>(including waterproofing products) | YES | NO |
| 10. **Wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydrometallurgy** | (a) wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodising)<br><br>(b) wastes from non-ferrous hydrometallurgical processes<br><br>(c) wastes from sludges and solids from tempering processes<br><br>(d) wastes from hot galvanising processes | NO | N/A |
| 11. **Wastes from shaping and physical and mechanical sur- face treatment of metals and plastics** | (a) hazardous portion of wastes from shaping and physical and mechanical surface treatment of metals and plastics<br><br>(b) wastes from water and steam degreasing pro- cesses | YES | YES |
| 12. **Oil wastes and wastes of liquid fuels (except edible oils)** | (a) waste hydraulic oils<br><br>(b) waste engine, gear and lubricating oils<br><br>(c) waste insulating and heat transmission oils<br><br>(d) oil/water separator contents<br><br>(e) wastes of liquid fuels | YES | YES |

| | | | |
|---|---|---|---|
| | (f) hazardous portion of other oil waste | | |
| 13. **Waste organic solvents, refrigerants and propellants** | (a) waste organic solvents, refrigerants and foam/aerosol propellants | NO | N/A |
| 14. **Other wastes not specified in the list** | a) hazardous portion of wastes from end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance<br><br>(b) hazardous portion of wastes from electrical and electronic equipment<br><br>(c) hazardous portion of wastes from off-specification batches and unused products<br><br>(d) wastes from discarded gases in pressure containers and discarded chemicals<br><br>(e) wastes from discarded batteries and accumu- lators<br><br>(f) wastes from transport tank, storage tank and barrel cleaning<br><br>(g) spent catalysts wastes<br><br>(h) oxidising substances wastes<br><br>(i) aqueous liquid wastes destined for off-site treatment<br><br>(j) waste linings and refractories | YES | NO |
| 15. **Construction wastes** | (a) wastes from bituminous mixtures, coal tar and tarred products<br><br>(b) discarded metals (including their alloys)<br><br>(c) waste soil (including excavated soil from contaminated sites), stones and dredging spoil<br><br>(d) wastes from insulation materials and asbestos-containing construction materials<br><br>(e) wastes from gypsum-based construction material<br><br>(f) wastes from other construction and demolition **[wastes]** | YES | YES |

| | | | |
|---|---|---|---|
| **16. Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)** | (a) wastes from natal care, diagnosis, treatment<br><br>(b) wastes from research, diagnosis, treatment or prevention of disease in humans prevention of disease involving animals | YES | YES |
| **17. Wastes from waste management facilities** | (a) hazardous portion of wastes from incineration or pyrolysis of waste<br><br>(b) hazardous portion of wastes from physico/ chemical treatments of waste<br><br>(c) hazardous portion of stabilised/solidified wastes<br><br>(d) hazardous portion of wastes from aerobic treatment of solid wastes<br><br>(e) hazardous portion of wastes from anaerobic treatment of waste<br><br>(f) landfill leachate wastes<br><br>(g) wastes from shredding of metal-containing wastes<br><br>(h) wastes from oil regeneration<br><br>(i) wastes from soil remediation | NO | N/A |

Industrial Groups indicated by "NO" in column 3 of Table 1 above are not present in the Bergrivier Municipal Area and are therefore omitted from the rest of the study for conciseness.

**3. Waste Classification and Management Regulations (GN. No. R. 634 of August 2013)**

These regulations supports and implements the provisions of the NEM:WA and, amongst others, establishes a procedure and mechanism for the listing of waste management activities that do not require a Waste Management License. It also states that waste must be classified according to the South African National Standard Globally Harmonized System of Classification and Labelling of Chemicals (SANS 10234:2008).

SANS 10234:2008 is a standard that classifies waste according to the physical and health hazards specific substances could potentially pose (including hazards to the aquatic environment).

GN. No. R. 634 also talks to the requirements for disposal, record keeping, re-classification etc. For example, it is stated that:

> *"Waste must be classified within 180 days of generation and should be re-used, recycled, recovered, treated and/or disposed of within 18 months of generation.*"

Based on physical and chemical characteristics hazardous waste can be grouped according to the South African National Standards 10234 (SANS 10234:2008) into the following classes:

*Table 2: Hazardous Waste Classes*

| Hazardous Waste Class (SANS 10234:2008) | |
|---|---|
| **Classes** | **Description** |
| 1 | Explosives |
| 2 | Gases |
| 3 | Flammable Liquid |
| 4 | Flammable Solids/Substances |
| 5 | Oxidising Substances |
| 6 | Poisonous and Infectious Substances |
| 7 | Radioactive Substances |
| 8 | Corrosive Substances |
| 9 | Miscellaneous Substances |

Each major constituent per waste stream identified was allocated a Hazardous Waste Class as per above table where applicable.

**4. Norms & Standard for the Assessment of Waste for Landfill Disposal (GN. No. R. 635 of August 2013)**

It covers the assessment of waste prior to landfilling and prescribes limits relating to chemical composition of waste from laboratory testing such as Leachable Concentration Threshold (LCT).

The industries identified are broadly defined as the following in this study based on Schedule 3 of the NEM:WA.

## Hazardous Waste in the Bergrivier Municipal Area

A limited amount of Hazardous Waste is generated within the Bergrivier Municipal Area. The Agriculture Industry (Industrial Group 1), Construction Waste (specifically, Industrial Group 15: PPC Cement) and Human or Animal Healthcare (Industrial Group 16) is of greatest importance and influence.

The data contained in this survey was obtained from owners/employees at the various places of business directly and it must be noted that there is a general lack of knowledge regarding waste generation or disposal throughout the entire spectrum of Industrial Groups, excluding Group 16 (Healthcare) who were all able to provide accurate and up to date information.

# Summary of Quantitative Data

*Table 3: Data summary*

| Major Constituent per Waste Stream | $m^3$/annum | tons/annum | litres/annum |
|---|---|---|---|
| 1. Diluted chlorine wash water (limited to 30ppm) | | 0.06 | |
| 2. Mercury complex solutions (Thimorasal) | 0.0025 | | |
| 3. Ash from charcoal | | 2,780.00 | |
| 4. Leftover food and meat off-cuts | 588.40 | 3.07 | |
| 5. PPC Cement – Various items | | 400.00 | |
| 6. Spent Thinners | 0.50 | | |
| 7. Spent Oil | 20.00 | | |
| 8. Old tyres | | 34.40 | |
| 9. Empty oil bottles | | 3.00 | |
| 10. Sharps | | 0.44 | 3,767.60 |
| 11. Infectious Waste | | 6.40 | 92,810.00 |
| 12. Pharmaceutical Waste | | 0.06 | 230.00 |
| 13. Anatomical Waste | | 0.32 | 240.00 |

# Data Collation Summary

The following tables summarise information obtained for this study. Only the following data is shown:

1) Where hazardous waste is indeed generated
2) Where amount of hazardous waste could be given by generators

| INDUSTRIAL GROUP | NAME OF BUSINESS/INSTITUTION | PROCESS GENERATING WASTE | SANS 10234 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | 1. Piketko Coolstores<br>Mr Riaan Swanepoel<br>Tel: 022 913 1166 | Rinsing, packagir | 9 | Diluted chlorine wash water (limited to 30ppm) | - | 0.06 | - | - | - | - | - | Evaporation | Apple and pear packaging facility. Also cooling of grapes. Pallets are force cooled and containers transported to harbour. 2 evaporation dams on site. |
| **1** | 2. Aartappel SA<br>Me Surien<br>Tel: 022 913 2206 | Testing of potatoes - laboratory | 6 | Mercury complex solutions (Thimorasal) | 0.0025 | - | - | - | - | - | - | Averda | Registered as a hazardous waste generator. 1 x 5 litre container is removed every two years. |
| **1** | 3. Liebco Vleishandelaars<br>Mr Schoeman<br>022 913 1505 | Butchery – meat offcuts | 9 | Polony paste | - | 0.2 | - | - | x | - | - | Own transport | Very little waste – mostly polony paste and not solid pieces of meat. Freezes any waste solid and transports to the waste transfer station with other waste. Takes it to the Piketberg Transfer Station. |
| **1** | 4. Plaasvleis Piketberg<br>Mr Adam Freeks<br>022 913 3984 | Butchery – meat offcuts | 9 | Meat offcuts | - | 0.12 | - | - | x | - | - | Own transport | Very little waste – not solid pieces of meat. Freezes any waste solid and transports to the waste transfer station with other waste. Takes it to the Piketberg Transfer Station. |
| **1** | 5. Superspar<br>Ms Sally Dietrich (butchery)<br>022 913 1163 | Butchery and food sales | 9 | Expired meat | - | 2.0 | - | - | x | - | - | Own transport | Expired meatstuff is frozen and stored in their waste area until 1 ton has been gathered. It is then transported to the Moorreesburg Landfill Site where a hole is prepared and the frozen meat is buried. Approximately 1 ton disposed of twice per year. |
| **1** | 6. OK Grocer<br>Eric Nagel<br>022 931 2061 | Butchery and food sales | 9 | Expired meat and fruit and vegetables (including take-away and deli) | 11 – 22 | - | - | - | - | - | Reuse | Pig farmer collects | Pig farmer collects every day or every second day depending on availability of waste. Waste is stored in 240 liter wheelie bins and a maximum of two full bins full of waste is generated weekly. |
| **1** | 7. Callie's Abbatoir<br>Mnr Steenkamp<br>022 931 3028 | Abbatoir | 9 | Guts and blood | 500 - 620 | - | - | - | - | Composting | Reuse | Own transport | All guts and blood is taken to Tomis Abbatoir in Hermon daily where they have a composting facility.<br>Binnegoed en bloed. 40 to 50 240liter bins are transported there per week. |
| **1** | 8. U-save<br>022 931 2621<br>Marthino Heraid | Food sales | 9 | Expired or unsold fruit and vegetables | 12.5 | - | - | - | - | - | - | Contractor and pig farmer collects | Expired fruit and vegetables are stored in a 240 liter wheelie bin and one bin every second day is collected by a pig farmer. No meat waste. |
| **1** | 9. Amawandle Pelagic (formerly Marine Products and part of Eigevis) | Fish processing – anchovies and sardines | 9 | Screened solids | - | ? | - | - | - | Used to manufacture fishmeal | Reuse | - | They have a Coastal Water Discharge Permit from DEA for which they will start annual reporting shortly. Currently do not have |

| INDUSTRIAL GROUP | NAME OF BUSINESS/INSTITUTION | PROCESS GENERATING WASTE | SANS 10234 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Mr Andre Viljoen<br>022 783 1103 | | 9 | Bloodied water | - | ? | - | - | - | Discharged into Bergrivier | - | - | figures but will be able to supply by early 2019 as they will enter the first phase of reporting now. Anchovies and sardines are processed. Heads, tails and guts are sent to fishmeal plant. Charcoal is required for heat to cook fish and to dry fishmeal. Ash is considered hazardous and removed by Enviroserv to Vissershok. Fish oil is recovered from processing and sold. Other protein rich fishwater not usable for fishmeal or fish oil is sold to Kelpak for use in their fertilizers. Bloodied water is discharged into the Bergrivier. Water needed for cooling is taken from Berg River, used, and discharged again into River. |
| | | | 9 | Cooling water | - | ? | - | - | - | Discharged into Bergrivier | - | - | |
| | | | ? | Ash from charcoal | - | 2017: 2780<br>Jan–Jul 2018: 2750 | - | - | Vissershok Landfill Site | - | - | Enviroserv | |
| | | | 9 | Fish oil | - | ? | - | - | - | - | Reuse | - | |
| | | | 9 | Protein rich fish water | - | ? | - | - | - | Sold to Kelpak to use in liquid fertiliser | Reuse | Collected by Kelpak | |
| **1** | 10. Laaiplek Superspar<br>022 783 0541 | Butchery and food sales | 9 | Expired meat and fruit and vegetables (including take-away and deli) | - | 0.75 | - | - | - | - | Reuse | Pig farmer collects | Pet mince is made from any meat offcuts and sold in packets of R10 – R12. Any meat, fruit, vegetables or bones that was not sold is collected by a pig farmer once every three weeks (stored in cooler until collection). |
| **1** | 11. OK Foods Velddrif<br>Amorie Page<br>022 783 0213 | Butchery and food sales | 9 | Expired meat and fruit and vegetables (including take-away and deli) | 10.4 | - | - | - | - | - | Reuse | Soup kitchen collects | No meat waste. Soup kitchen collects the leftover food on Thursdays (fruit, vegetables, bread). Approximately 2 trolleys per week (200 liters each). |
| **5** | 12. Piketberg Drukkers<br>Marianna Kirsten<br>022 913 1679 | Printing and refilling of printers | 3 | Spent thinners | 0.2 | - | - | - | - | - | - | - | Evaporates**.** |
| **7** | 13. Piket Glas & Kaste<br>022 913 3137<br>Deon Pienaar | Glass cutting | - | No hazardous waste generation | - | 7.2 | - | - | - | - | - | - | No glass is manufactured on site; only cut to size. Broken window glass cannot be recycled as it contains too much chemicals. It is therefore stored until enough has been collected to transport to the Refuse Transfer Station where it is dumped in a container. Some golfcourses also request the glass to use as part of the construction of their greens. |
| **11** | 14. Piket Implemente<br>Miena (H&SO)<br>022 913 2435<br>miena@piket.co.za | Turners of steel | 2 | Used Thinners | 0.1 | - | - | - | - | - | Recycle | Indy Oil and Go Green | No steel manufacturing. |
| **11** | 15. Piketberg Power Tools<br>Mr Chris Watson<br>022 913 3957 | Servicing and repairs of power tools and electric equipment | 6 | Motor/engine oil | 0.2 | - | - | - | - | - | Recycled | Independent contractor comes to collect | Oil – engine oil. There are various entities collecting engine oil; the producer receives a certificate indicating safe disposal but they sell to Warwick Patay. Approximately 210 liters of engine oil per year (drum). |
| **11** | 16. G van Wyk Ingenieurswerke<br>Gerrit van Wyk<br>083 285 3938<br>022 931 3262 | Engineering works | 6 | Motor/engine oil | 0.2 | - | - | - | - | - | Recycled | Independent contractor comes to collect | Do not manufacture the steel themselves.<br>They sell motoroil to Warwick Patay when necessary (approximately 1 x 210 liter drum per year) |

| INDUSTRIAL GROUP | NAME OF BUSINESS/INSTITUTION | PROCESS GENERATING WASTE | SANS 10234 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **12** | 17. NQF Vervoer<br>022 913 1616 | Transport | 6 | Spent Oil | 0.2 | - | - | - | - | - | Recycled | Collection by Oilkol | Oilkol collects, very little oil as servicing is mostly done off site. One 210 liter drum per year. |
| **12** | 18. Potgieter Transport<br>022 913 1735<br>Alwyn van Deventer | Transport | 6 | Spent Oil | 2.2 | | - | - | - | - | Recycled | Collected by LA Fuels | LA Fuels collects about 1 x 210 liter drum per month |
| | | | 9 | Old Tyres | - | 3.6 | - | - | - | - | Recycled | Own transport | Old Tyres are taken to N7 Tyres for recycling (approximately 30 per month) |
| **12** | 19. Midas Motolek<br>022 913 1939 | Workshop | 6 | Spent Oil | 4.2 | | - | - | - | - | Recycled | Collected by Oilkol | Oilkol collects about 2 x 210 liter drums per month |
| **12** | 20. Piketberg Bandediens BK<br>022 913 3582<br>Leon Visser | Sale of tyres | 9 | Old tyres | - | 23.0 | - | - | - | - | Recycle | REDISA collects | REDISA collects the tyres – approximately 190 per month. |
| **12** | 21. Bothma Motorbakwerke<br>021 913 1645<br>Mr Christo Bothma | Spraypainting and panelbeating of motor vehicles | 6 | Spent Oil | 0.2 | - | - | - | - | - | Recycle | Oilkol collects | Oilkol collects approximately 1 x 210 liter drum per year. |
| | | | 3 | Used Thinners | 0.2 | - | - | - | - | - | Recycle | Oilkol collects | Oilkol collects approximately 1 x 210 liter drum per year. |
| **12** | 22. Build-it<br>022 913 1950<br>Gerhard Steenkamp | Servicing of machinery | 6 | Spent oil | 0.2 | - | - | - | - | - | Recycle | Oilkol collects | Oilkol collects, very little oil as servicing is mostly done off site. One 210 liter drum per year. |
| **12** | 23. Hi–Q<br>022 931 2105/3670<br>Mr Louw | Sale of tyres | 9 | Old tyres | - | 25.0 | - | - | - | - | Recycle | REDISA collects | REDISA collects the tyres – approximately 220 per month. |
| **12** | 24. Porterville Tyre & Exhaust<br>022 931 3314<br>Henri Smit | Exhaust and tyre sales and fitment | 6 | Spent Oil | - | 0.96 | - | - | - | - | Recycled | Collected by independent contractor | Warwick Patay collects about 80 liters per month |
| | | | 9 | Old Tyres | - | 1.8 | - | - | - | - | Recycled | Own transport | Old Tyres collected by REDISA (50 to 100 per month) |
| **12** | 25. Bergrivier Meganies<br>022 783 1207<br>Worsie Botha | Servicing of motor vehicles | 6 | Motor oil | 2.6 – 15.6 | - | - | - | - | - | Recycle | Oilkol collects | Oilkol collects oil once per month ranging between 50 – 300 liters as well as Oil filter (approximately 120 per month)<br>Farmers collect tyres |
| | | | 6 | Oil filters | - | 1.5 | - | - | - | - | Recycle | Oilkol collects | |
| | | | 9 | Tyres | | 1.0 | - | - | - | - | Reuse | Farmers collect | |
| **12** | 26. Bergrivier Motors: Petrol Station<br>022 783 0946<br>Chrystal Galant | Fuel station | 6 | Empty oil containers | - | 3.0 | - | - | x | - | - | - | No hazardous waste except for empty motor oil containers – gets put into the normal refuse for removal by Municipality (approximately 15 per day) |
| **15** | 27. PPC Cement De Hoek Environmental Department<br>Lushca Hendricks – Environmental Practitioner<br>022 913 8431<br>lushca.hendrick@ppc.co.za | Mining Processing and Production of Cement | ? | Various – see notes | - | Disposed: 50<br><br>Recycled: 350 | - | - | x | - | Recycle | Averda: HCRW, Oil/Water Mix, Oil Contaminated Waste<br>FFS: Spent Oil _ Spent Oil<br>Reclite: Fluorescent tubes and other | Total consists of:<br>1. HCRW<br>2. Oil/Water Mix<br>3. Oil Contaminated Waste<br>4. Spent Oil<br>5. Fluorescent tubes and other lighting equipment<br>6. Asbestos contaminated material<br>7. Printer Cartridges<br>8. Refractories |

| INDUSTRIAL GROUP | NAME OF BUSINESS/INSTITUTION | PROCESS GENERATING WASTE | SANS 10234 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | lighting equipment<br>Focus Asbestos: Asbestos contaminated material<br>Green Office: Printer Cartridges<br>Retromin: Refractories | |

| KEY INDUSTRY 16 | SERVICE PROVIDER | WASTE TYPE VOLUME/MASS PER ANNUM | NOTES |
|---|---|---|---|
| **PIKETBERG** | | | |
| **I. HOSPITALS** | | | |
| Radie Kotze Hospital<br>Me Berta Smith<br>022 913 1175<br>Berta.smith@westerncape.gov.za | Averda | Sharps: ± 0.44 tons/annum<br>Infectious Waste: ± 6.3 tons/annum<br>Pharmaceutical Waste: ± .06 tons/annum<br>Anatomical Waste: ± 0.32 tons/annum | Averda collects once per week from the Hospital. They used to incinerate on site but this is no longer done. |
| **II. CLINICS** | | | |
| **i. Private Clinics** | | | |
| Piketberg Medical Centre<br>(Dr Scheepers and Partners)<br>Ms Magdalena Mostert<br>022 913 1146<br>rekeninge@pmsdokters.co.za | Compass Medical Waste Services | Sharps: ± .04 tons/annum<br>Infectious Waste: ± 0.1 tons/annum<br>Pharmaceutical Waste: Quantity unknown | The Centre has recently changed from Solid Waste Technologies as service provider to Compass Medical Waste Services. Dr Bruwer and Scheepers handle their HCRW separately but it is removed simultaneously bi-monthly. |
| **iii. District Clinics** | | | |
| Piketberg Clinic<br>Sister Marietjie Brits<br>022 913 1660 | Averda | Sharps: ± 1200 litre/annum<br>Infectious Waste: ± 3600 litre/annum<br>Pharmaceutical Waste: Quantity unknown | The waste is generated at Piketberg Clinic as well as 6 x satellite clinics and 1 x mobile clinic.<br>Sharps: The Clinic has 10 x 5 litre sharps containers which are removed twice per month by Averda.<br>Infectious Waste: The Clinic has 3 x 50 litre boces that are removed twice per month by Averda<br>Pharmaceuticals are also collected on an Ad Hoc basis (mostly expired)<br>All medical waste is stored in a dedicated medical waste room until collection. |
| **iv. Industrial Clinics** | | | |
| PPC Cement de Hoek<br>Sister Lesch<br>022 913 8237 | Averda | Sharps: ± 60 litre/annum<br>Infectious Waste: ± 800 litre/annum<br>Pharmaceutical Waste: ± 130 litre/annum | Averda is requested to collect as soon as the containers are filled – no formal routine.<br>The clinic has 1 x 7.6 litre sharps container (weighed 1.25 kg on 18 May 2018 and 1.25kg on 6 July 2018.<br>The clinic has 2 x 50 litre boxes for disposal of infectious waste (bandages, bloody items, sugar and iron tests) in one and lung function test filters in the other (weighed 6.4 kg on 18 May 2018 and 8.15kg on 6 July 2018 combined).<br>The clinic has 1 x 20 litre green container for expired pharmaceuticals collected 6 to 7 times per year. |
| **III. MORTUARIES AND FUNERAL PARLOURS** | | | |
| Avbob<br>Ms Ronel van Zyl<br>083 952 4512<br>022 913 1315<br>piketberg@funeral.avbob.co.za | Compass Medical Waste Services | Sharps: None<br>Infectious Waste: ± 240 litre/annum | Avbob has 1 x 20 litre box for infectious waste which is removed once per month by Compass Medical Waste Services. |
| Carstens Begrafnisondernemers<br>Mr Johan Carstens<br>022 913 1748 | Averda | Sharps: None<br>Infectious Waste: ± 200 litre/annum | Carstens Begrafnisondernemers has 1 x 50 litre box for infectious waste which is removed every three months by Averda. |

| KEY INDUSTRY<br>16 | SERVICE PROVIDER | WASTE TYPE<br>VOLUME/MASS PER ANNUM | NOTES |
|---|---|---|---|
| Mr Gerhard Carstens<br>082 389 4885<br>carstenspiket@gmail.com | | | |
| Seder Ontwikkeling & Bystandsdienste<br>Mr Davids<br>022 913 1474<br>083 726 6917<br>wmninsurance@gmail.com | None | Sharps: None<br>Infectious Waste: Unknown | No waste removal company is appointed. All gloves, masks, nappies, bandages, clothes and anatomical waste is placed in a plastic bag and put into the coffin with the deceased and buried. |
| **IV. OLD AGE HOMES** | | | |
| AJ Liebenberg Old Age Home<br>Sister Grobbelaar<br>022 913 1228 | Averda | Sharps: ± 60 litre/annum<br>Infectious Waste: ± 1200 litre/annum | AJ Liebenberg Old Age Home has 1 x 5 litre sharps container removed once per month by Averda.<br>They also have 2 x 50 liter boxes which are removed once per month (30 kg in total).<br>All diapers are disposed of via the normal municipal refuse collection system. |
| **V. GENERAL PRACTITIONERS** | | | |
| Drs BF Smit and W de Villiers; Morrison Nursing Aid<br>Ms Barbara Abdhuraman<br>022 913 1172 | Averda | Sharps: ± 80 litre/annum<br>Infectious Waste: ± 1800 litre/annum | They have 8 x 6.2 litre sharps containers emptied into 2 x 20 litre containers which are removed every six months. They also have 3 x 50 liter boxes for infectious waste removed once per month. |
| Drs Scheepers and Partners<br>(Refer to Piketberg Medical Centre) | | | |
| **VI. VETERINARY SERVICES** | | | |
| Piketberg Animal Hospital<br>Nadine de Waal<br>022 913 1148<br>piketberganimalhosp@telkomsa.net<br>E-mail sent, no response received. | BCL Medical Waste | Sharps: Unknown<br>Infectious Waste: Unknown<br>Caracasses: Unknown | |
| State Veterinarian<br>Mr Hendrik Hagen<br>082 896 9570 | Own transport | Sharps: ± 80 litre/annum<br>Infectious Waste: ± 120 litre/annum<br>Carcasses: None | Mr Hagen transports all medical waste to the to Malmesbury Magistrate's Court.<br>He has 1 x 20 litre sharps container emptied every 3 months.<br>He has 1 x 20 litre infectious waste container emptied every second month.<br>He does not deal with carcasses at all. |
| **VII. DENTISTS** | | | |
| Dr Harold Truter<br>Ms Maria Adams<br>022 913 1630 | Averda | Sharps: ± 180 litre/annum<br>Infectious Waste: ± 240 litre/annum | The amount of waste quoted is from this practice in Piketberg as well from one in Velddrif where the dentist works once or twice per month. It also includes a mobile practice in Citrusdal. All waste is transported to Piketberg.<br>The practice has 3 x 5 litre sharps container.<br>It also has 3 x 5 litre container for empty ampoules.<br>They also have 3 x 50 litre box for infectious waste including teeth.<br>Averda collects waste once per month which usually includes 3 x 5 liter sharps containers, 1 x 20 liter infectious waste box. |
| **PORTERVILLE** | | | |
| **I. HOSPITALS** | | | |
| Lapa Munnick Hospital<br>Sister Adonis<br>022 931 2140 | Averda | Sharps: ± 480 litre/annum<br>Infectious Waste: ± 72 000 litre/annum<br>Pharmaceutical Waste: ± 20 litre/annum<br>Anatomical Waste: ± 120 litre/annum | 2 – 5 x 5 litre sharps containers are removed every second week.<br>The hospital has 50 litre and 142 litre boxes for infectious waste and approximately 30 boxes are removed every two weeks in total (some 50 litres and some 142 litres).<br>For anatomical waste the hospital has 1 x 10 litre bucket which is removed once monthly.<br>For Pharmaceutical waste the hospital has 1 x 10 litre bucket removed every six months. |
| Voorberg Correctional Services<br>Sister Pienaar<br>022 931 8000<br>022 931 8044/8189/8046 | Barker Hygiene | Sharps: ± 240 litre/annum<br>Infectious and Anatomical Waste:<br>± 2400 litre/annum | The correctional facility has 4 x 5 litre sharps containers which is removed monthly.<br>Approximately 4 to 5 x 50 litre boxes with infectious and anatomical waste is removed monthly. Anatomical waste is generated from male circumcision which is carried out on a monthly basis. |
| **i. Pharmacies with Clinics** | | | |

| KEY INDUSTRY<br>16 | SERVICE PROVIDER | WASTE TYPE<br>VOLUME/MASS PER ANNUM | NOTES |
|---|---|---|---|
| Porterville Gesondheidssentrum<br>Ms Monique Benn<br>022 931 2121<br>zeldaherbst@gmail.com | Solid Waste Technologies | Sharps: ± 43 litre/annum<br>Infectious Waste: ± 60 litre/annum | Waste is removed approximately three times per year.<br>The Centre has 2 x 7.2 liter sharps containers and 1 x 20 liter infectious waste container. |
| **II. MORTUARIES AND FUNERAL PARLOURS** | | | |
| Valley Funerals<br>086 082 5539 | N/A | Sharps: None<br>Infectious Waste: None | This is not a funeral parlour in Porterville, just an office. |
| **III. OLD AGE HOMES** | | | |
| Huis Nerina<br>Sister van der Westhuizen<br>022 931 2695 | Cannon Hygiene | Sharps: ± 20 litre/annum<br>Infectious Waste: ± 600 litre/annum | They have 1 x 5 liter sharps container removed every three months.<br>They have 1 x 50 liter infectious waste box removed every month.<br>All diapers are collected by Municipal vehicles forming part of the household waste fraction. |
| **IV. GENERAL PRACTITIONERS** | | | |
| Drs P Nell and E Wilson<br>Penny Brand<br>022 931 2155 | Hygiene Elite | Sharps: ± 172 litre/annum<br>Infectious Waste: ± 430 litre/annum | Waste is removed once every six weeks by Hygiene Elite.<br>They have 1 x 20 litre sharps container and 1 x 50 litre box for infectious waste. |
| Dr Botha<br>(previously Dr Noeth's practice)<br>Ms Wilma Crafford<br>022 931 2172 | Averda | Sharps: ± 18 litre/annum<br>Infectious Waste: ± 200 litre/annum | The rooms have 3 x 1.5 litre sharps containers removed once in three months as well as 1 x 50 litre infectious waste box. |
| **V. VETERINARY SERVICES** | | | |
| Berg River Animal Consulting Room<br>Drs Triegaard and Trollope<br>Charlene Plain<br>023 230 0123 | BCL Medical Waste | Sharps: ± 120 litre/annum<br>Anatomical: ± 120 litre/annum | The rooms have 1 x 5 litre sharps container removed bi-weekly and well as 1 x 5 litre bucket for anatomical waste. |
| **VI. DENTISTS** | | | |
| Dr SE Kotze and van Wyk<br>Ms Rachel Daniels<br>022 931 2760 | Hygiene Elite | Sharps: ± 30 litre/annum<br>Infectious Waste: ± 120 litre/annum | Waste is removed every second month and the practice has 1 x 5 litre sharps container as well as 1 x 20 litre box for infectious waste. They are the only dentistry in town. |
| **VELDDRIF** | | | |
| **I. CLINICS** | | | |
| **i. Private Clinics** | | | |
| Jacqui Health Care Clinic<br>Jacqueline Mostert<br>022 783 0786 | Averda | Sharps: ± 7.6 litre/annum<br>Infectious Waste: ± 40 litre/annum | The Clinic has 1 x 7.6 litre sharps container which is removed once per year. It also has 2 x 20 liter boxes for empty ampoules removed once per year. |
| **ii. District Clinics** | | | |
| Velddrif Clinic<br>Sister Nel<br>022 814 0142 | Averda | Sharps: ± 600 litre/annum<br>Infectious Waste: ± 8100 litre/annum<br>Pharmaceutical Waste: ± 80 litre/annum | The Clinic has 10 x 5 litre sharps containers, 5 full containers are removed every second week.<br>They also have 50 liter and 142 litre boxes for infectious waste of which 5 x 50 litre and 3 x 142 litres are removed monthly.<br>Pharmaceuticals: 1 x 20 litre green bucket is removed every 3 months. |
| **iii. Pharmacies With Clinics** | | | |
| Brug Apteek<br>Mr Johan Moolman<br>022 783 0424 | BCL Medical Waste | Sharps: ± 240 litre/annum<br>Infectious Waste: ± 600 litre/annum | The Clinic has 1 x 20 litre sharps container which is emptied once per month.<br>They also have 1 x 50 litre box for infectious waste which is emptied once per month. |
| **II. OLD AGE HOMES** | | | |
| Aanoewer Tuisversorging<br>Ms Hanneke<br>022 783 0048 | N/A | Sharps: None<br>Infectious Waste: None<br>Pharmaceutical Waste: None | They no longer form part of the Department of Health so they have scaled down tremendously and do not generate any HCRW. |
| **III. GENERAL PRACTITIONERS** | | | |

| KEY INDUSTRY<br>16 | SERVICE PROVIDER | WASTE TYPE<br>VOLUME/MASS PER ANNUM | NOTES |
|---|---|---|---|
| Dr S Annandale<br>Ms Bianca Venter<br>022 783 0040 | Own transport | Sharps: Unknown<br>Infectious Waste: Unknown<br>Pharmaceutical Waste: Unknown | Dr Annandale has a private arrangement with the WestCoars Life Private Hospital in Vredenburg. He transports all of the sharps and infectious waste to the hospital once per month in order for it to form part of their waste disposal. |
| Dr N Vermeulen<br>Ms Elta Lourens<br>022 783 0027 | Averda | Sharps: ± 137 litre/annum<br>Infectious Waste: ± 300 litre/annum | The practice has a 3 x 7.6 litre sharps containers as well as 1 x 50 litre box for infectious waste which are collected every second month.<br><br>**From the procedure room all infectious waste is thrown into the normal refuse bin to form part of Municipal Collections.** |
| **IV. VETERINARY SERVICES** | | | |
| Velddrif Animal Clinic<br>Celia Gildenhuys<br>074 740 1111 | | Sharps: Unknown<br>Infectious Waste: Unknown<br>Carcasses: None | This clinic only treats mange with injections. Needles are taken to Vredenburg Veterinarians as well as to Doctor Dorette at Green Acres. When veterinarians come to the clinic to do sterilisations they also take the anatomical and infectious waste with them when they leave. |
| **V. DENTISTS** | | | |
| Drs CP Steyn & Ryke<br>022 783 0747<br>Number does not exist | - | - | - |
| Dr HD Boock<br>022 783 0747<br>Number does not exist | - | - | - |

# Data collation

Information shown in the tables below have been obtained by means of interviews with the relevant role-players, either telephonically or on site. Where comments are made in red, attention must be drawn to inappropriate hazardous waste management practices which should result in Municipal intervention.

| KEY INDUSTRY 1 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIKETBERG** | | | | | | | | | | | | |
| 1. Winkelshoek Wynkelder Bottelering Mr Dirk Hanekom (Production Manager) Halmanshof Road Tel: 022 913 1092 | Bottling of wine | 8 | Weak caustic soda | ? | - | x | - | - | - | - | - | Caustic soda is acquired from Sealed Air and a 5% solution is used to wash the stainless steel tanks and fill machines. Glass bottles are no longer washed (as per previous study), but new bottles procured and filled. Tanks are washed as soon as it has been emptied. ±25 liters concentrate is used per month and is mixed with water. The solution is drained into a sump pump and the tanks are then washed with a 5% peroxide base solution (CJP465S from CJ Pedro). ±25 liters concentrate is used per month and is mixed with water. After these two processes the tanks are rinsed with water. The 6$m^3$ sump pump holds all of the washings and has a submersible pump which pumps the contents to the main sewer line when full. Permission obtained from municipality for sewer discharge. 34 000 liters of water used weekly. |
| | | 9 | Floor washings | ? | - | x | - | - | - | - | - | Daily floor spills/washings<br>Floors are washed with an anionic detergent (eg. Sunlight Liquid) |
| 2. Skenkfontein Kelders Mr Hennie Hanekom Owner/Winemaker Tel: 022 942 1985 sf@winkelshoek.co.za | Wine making from white and red grapes | 9 | Pips and skins | ? | - | - | - | - | Composting | Reuse | Farmer | Processed to make compost for vineyards by drying, then adding lime and chaff. It is then left for a year where after it is used in the vineyards. |
| | | 9 | Lees | ? | - | - | - | - | | Reuse | Brenn-O-Kem collects | Brenn-O-Kem washes the lees and beneficiates. |
| | | 9 | Cellar effluent | ? | - | - | - | - | Irrigating kikuyu | Reuse | Farmer | Water with relatively high pH. Pre-treated and then used to irrigate kikuyu. |
| 3. Kaap Agri Mr JJ Human Lang Street, PIketberg 022 913 1115 | Sales of agricultural remedies | - | No hazardous waste processed, only sell sealed pesticides | - | - | - | - | - | - | - | - | No hazardous waste generated, sealed pesticides sold. Empty pesticide containers become the property of farmers. No workshop on site |
| 4. Kaap Agri Grain Silos Mr Charles Williams 022 913 1009 | Storage and minor processing of grain – no hazardous waste | - | No chemicals used on site | - | - | - | - | - | - | - | - | Empty pesticide containers are given back to the manufacturer in Malmesbury.<br>No chemicals used on site. |
| 5. Viking Aventis Cropscience and Store Mr Andre Eksteen Adam Tas Road 021 913 1826 | Storage and sale of agricultural remedies | - | No hazardous waste, only sell sealed pesticides | - | - | - | - | - | - | - | - | No hazardous waste generated, sealed pesticides sold. Empty pesticide containers become the property of farmers. |
| 6. Piketko Coolstores Mr Riaan Swanepoel Tel: 022 913 1166 | Rinsing, packaging and cooling of fruit | 9 | Diluted chlorine wash water (limited to 30ppm) | - | 0.06 | - | - | - | - | - | Evaporation | Apple and pear packaging facility. Also cooling of grapes. Pallets are force cooled and containers transported to harbour. 2 evaporation dams on site. |

| KEY INDUSTRY 1 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7. Piketberg Droeë Vrugte<br>Ms Wilma Rossouw<br>Tel: 022 913 1990 | Packaging and marketing only | - | No hazardous waste | - | - | - | - | - | - | - | - | Counters and floors washed with an anionic detergent and an ammonia based all purpose cleaner. |
| 8. Nitrophoska<br>Tel: 022 913 1324 | Sale of pesticides | - | Empty containers become the property of buyer | - | - | - | - | - | - | - | - | - |
| 9. Aartappel SA<br>Me Surien<br>Tel: 022 913 2206 | Testing of potatoes - laboratory | 6 | Mercury complex solutions (Thimorasal) | 0.0025 | - | - | - | - | - | - | Averda | Registered as a hazardous waste generator. 1 x 5 litre container is removed every two years. |
| 10. Moravia Wynkelders<br>Mr Frederick Troos<br>Tel: 022 912 4515<br>Number does not exist | Winemakers | - | - | - | - | - | - | - | - | - | - | - |
| 11. Nexus AG<br>Ms Tanja Visagie<br>Tel: 022 914 5644 | Pesticide distributors | - | Empty containers become property of the buyer | - | - | - | - | - | - | - | - | - |
| 12. Liebco Vleishandelaars<br>Mr Schoeman<br>022 913 1505 | Butchery – meat offcuts | 9 | Polony paste | - | 0.2 | - | - | x | - | - | Own transport | Very little waste – mostly polony paste and not solid pieces of meat. Freezes any waste solid and transports to the waste transfer station with other waste. Takes it to the Piketberg Transfer Station. |
| 13. Kekkel & Kraai<br>022 913 2297<br>Number does not exist | Frozen chicken products | - | - | - | - | - | - | - | - | - | - | - |
| 14. Plaasvleis Piketberg<br>Mr Adam Freeks<br>022 913 3984 | Butchery – meat offcuts | 9 | Meat offcuts | - | 0.12 | - | - | x | - | - | Own transport | Very little waste – not solid pieces of meat. Freezes any waste solid and transports to the waste transfer station with other waste. Takes it to the Piketberg Transfer Station. |
| 15. Shoprite<br>Mr Minnaar<br>022 913 8080 | Butchery and food sales | 9 | Meat offcuts | - | ? | - | - | - | - | Reuse | Farmer collects | Very little food waste from the butchery, deli, bakery and fresh produce sections. No contractor appointed. Pig farmer collects all food waste. Quantities unsure but aim is to have as little as possible food waste. |
| | | 9 | Unsold fruit and vegetables | - | ? | - | - | - | - | Reuse | Farmer collects | |
| | | 9 | Bakery and deli goods | - | ? | - | - | - | - | Reuse | Farmer collects | |
| 16. Superspar<br>Ms Sally Dietrich (butchery)<br>022 913 1163 | Butchery and food sales | 9 | Expired meat | - | 2.0 | - | - | x | - | - | Own transport | Expired meatstuff is frozen and stored in their waste area until 1 ton has been gathered. It is then transported to the Moorreesburg Landfill Site where a hole is prepared and the frozen meat is buried. Approximately 1 ton disposed of twice per year. |
| **PORTERVILLE** | | | | | | | | | | | | |
| 17. Porterville Cellars<br>022 931 2170<br>Unable to establish contact | Winemakers | - | - | - | - | - | - | - | - | - | - | |
| 18. Conradie Boerderye<br>Ms Groenewald<br>022 931 2911 | Farming activities | - | No hazardous waste | - | - | - | - | - | - | - | - | |
| 19. Dreammaker Fruits<br>022 931 8500<br>Jan Kemp | Packaging of fruit | - | No hazardous waste | - | - | - | - | - | - | - | - | |

| KEY INDUSTRY 1 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 083 799 4594 | | | | | | | | | | | | |
| 20. Houd Constant Meat Distributors<br>Riette Rossouw<br>022 931 2288 | Butchery – meat offcuts | 9 | Meat offcuts | - | - | - | - | - | - | - | - | All of the meat offcuts is given used (soup kitchen, dogs). |
| 21. Oranje Slagterye<br>Mnr Steenkamp<br>022 931 2380 | No waste – refer to Callie's Abbatoir | - | - | - | - | - | - | - | - | - | - | |
| 22. OK Grocer<br>Eric Nagel<br>022 931 2061 | Butchery and food sales | 9 | Expired meat and fruit and vegetables (including take-away and deli) | 11 – 22 | - | - | - | - | - | Reuse | Pig farmer collects | Pig farmer collects every day or every second day depending on availability of waste. Waste is stored in 240 liter wheelie bins and a maximum of two full bins full of waste is generated weekly. |
| 23. Callie's Abbatoir<br>Mnr Steenkamp<br>022 931 3028 | Abbatoir | 9 | Guts and blood | 500 - 620 | - | - | - | - | Composting | Reuse | Own transport | All guts and blood is taken to Tomis Abbatoir in Hermon daily where they have a composting facility.<br>Binnegoed en bloed. 40 to 50 240liter bins are transported there per week. |
| 24. U-save<br>022 931 2621<br>Marthino Heraid | Food sales | 9 | Expired or unsold fruit and vegetables | 12.5 | - | - | - | - | - | - | Contractor and pig farmer collects | Expired fruit and vegetables are stored in a 240 liter wheelie bin and one bin every second day is collected by a pig farmer. No meat waste. |
| **VELDDRIF** | | | | | | | | | | | | |
| 25. Bergrivier Visserye<br>022 783 0388<br>Number does not exist | - | - | - | - | - | - | - | - | - | - | - | |
| 26. De Plaat Kelders | Sales only | - | No hazardous waste | - | - | - | - | - | - | - | - | |
| 27. AJF Eigelaar & Sons<br>022 783 1125 | - | - | - | - | - | - | - | - | - | - | - | Refer to Amanwandle Pelagic below (number 20) |
| 28. Eigelaar Marine Store<br>022 783 0054 | Sale of fishing equipment | - | No hazardous Waste | - | - | - | - | - | - | - | - | |
| 29. Blue Ocean Mussels (formerly La Vie Seafood)<br>Mr Francois Dunn<br>021 783 2101 | Processing of Mussels | 9 | Saline water | ? | - | - | x | - | - | - | - | Mussel farm in Saldanha. Mussels transported to factory by truck, and then placed into chiller. Salt water drains from mussels and into three French drains. Mussels are then steamed and processed. In French drains impurities and proteins are removed before remainder pumped into main sewerline. Approximately 20 – 50$m^3$ Municipal water used daily; unsure of how much is discharged back into sewer.<br><br>Floors are washed with biodegradable chemicals from Kemklean (Bacterex C, Hygen Q45 and NFP). These are used on a rotational basis to ensure that the micro-organisms do not become resistant to it.<br>The Municipality analyses the water quality twice a year and the NRCS on a monthly basis. |
| | | 9 | Floor washings | | | | | | | | | |
| 30. Amawandle Pelagic (formerly Marine Products and part of Eigevis)<br>Mr Andre Viljoen | Fish processing – anchovies and sardines | 9 | Screened solids | - | ? | - | - | - | Used to manufacture fishmeal | Reuse | - | They have a Coastal Water Discharge Permit from DEA for which they will start annual reporting shortly. Currently do not have figures but will be able to supply by early 2019 as they will enter the first phase of reporting now. Anchovies and sardines are processed. Heads, tails and guts are sent |
| | | 9 | Bloodied water | - | ? | - | - | - | Discharged into Bergrivier | - | - | |

| KEY INDUSTRY 1 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 022 783 1103 | | 9 | Cooling water | - | ? | - | - | - | Discharged into Bergrivier | - | - | to fishmeal plant. Charcoal is required for heat to cook fish and to dry fishmeal. Ash is considered hazardous and removed by Enviroserv to Vissershok. Fish oil is recovered from processing and sold. Other protein rich fishwater not usable for fishmeal or fish oil is sold to Kelpak for use in their fertilizers. Bloodied water is discharged into the Bergrivier. Water needed for cooling is taken from Berg River, used, and discharged again into River. |
| | | ? | Ash from charcoal | - | 2017: 2780 Jan–Jul 2018: 2750 | - | - | Vissershok Landfill Site | - | - | Enviroserv | |
| | | 9 | Fish oil | - | ? | - | - | - | - | Reuse | - | |
| | | 9 | Protein rich fish water | - | ? | - | - | - | Sold to Kelpak to use in liquid fertiliser | Reuse | Collected by Kelpak | |
| 31. Nossab Fisheries<br>Amelia Basson<br>022 783 0257<br>083 335 7887 | Fish Processing | 9 | Bloodied water | - | ? | x | - | - | Pumped into main sewer line | | | When the factory is cleaned all guts and scales are trapped by filters before the waste water is pumped into the main sewer line. Snoekguts are given to pig farmers as feed. **No current off-take for scales and currently buried on site (small quantities).** Factory is cleaned with disinfectant. |
| | | 9 | Guts | - | ? | - | - | - | Given to pig farmers as feed | Reuse | Farmer collects | |
| | | 9 | Fish scales | - | ? | - | - | - | Buried on site | - | - | |
| 32. Sonskyn Fisheries<br>022 783 1521<br>Number does not exist | - | - | - | - | - | - | - | - | - | - | - | - |
| 33. Tredouw Vishandelaars<br>083 685 1819<br>Wrong number | - | - | - | - | - | - | - | - | - | - | - | - |
| 34. Gallo Group<br>Schalk Visser<br>No contact information | Mussel Processing | - | - | - | - | - | - | - | - | - | - | - |
| 35. S W A R Development Fisheries<br>022 783 2838<br>Wrong contact number | - | - | - | - | - | - | - | - | - | - | - | - |
| 36. Kekkel & Kraai<br>Mnr Kobus Botha<br>022 783 0337 | Food sales | - | No food waste | - | - | - | - | - | - | - | - | Sells fresh and frozen chicken (County Fair with abbatoirs in Cape Town and forms part of the Astral Group). Receives whole carvasses, process and package it on site. Only food waste generated on site are potato peels (sale of chips). Receives fresh chicken every second day and rotation is very fast therefore all meat not sold within two days gets frozen or donated to the soup kitchen. |
| 37. Laaiplek Superspar<br>022 783 0541 | Butchery and food sales | 9 | Expired meat and fruit and vegetables (including take-away and deli) | - | 0.75 | - | - | - | - | Reuse | Pig farmer collects | Pet mince is made from any meat offcuts and sold in packets of R10 – R12. Any meat, fruit, vegetables or bones that was not sold is collected by a pig farmer once every three weeks (stored in cooler until collection). |
| 38. OK Foods Velddrif<br>Amorie Page<br>022 783 0213 | Butchery and food sales | 9 | Expired meat and fruit and vegetables (including take-away and deli) | 10.4 | - | - | - | - | - | Reuse | Soup kitchen collects | No meat waste. Soup kitchen collects the leftover food on Thursdays (fruit, vegetables, bread). Approximately 2 trolleys per week (200 liters each). |
| 39. Cerebos Salt = National Salt<br>022 783 1133 | Manufacturing of salt | - | No hazardous waste generation | - | - | - | - | - | - | - | - | Water may be extracted from the ocean or river to use as part of the process but may not be put back. Water is recirculated until it evaporates. |

| KEY INDUSTRY 1 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Petrus Lambrecht | | | | | | | | | | | | |
| 40. Khoisan Trading 022 783 1520 | Manufacturing of salt | - | No hazardous waste generation | - | - | - | - | - | - | - | - | |
| 41. Kliphoek Soutwerke | Manufacturing of salt | - | No hazardous waste generation | - | - | - | - | - | - | - | - | |
| 42. Velddrif Salt Company | Manufacturing of salt | - | No hazardous waste generation | - | - | - | - | - | - | - | - | |

| KEY INDUSTRY 2 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIKETBERG** | | | | | | | | | | | | |
| 1. Piketberg Glas & Kaste See E1 above | - | - | - | - | - | - | - | - | - | - | - | - |
| **PORTERVILLE** | | | | | | | | | | | | |
| 2. Cruywagen Skrynwerke 022 931 3181 | Carpentry | - | No hazardous waste generation | - | - | - | - | - | - | - | - | - |
| 3. Mondi Corrugated 022 931 2640 | Sales | - | No hazardous waste generated | - | - | - | - | - | - | - | - | - |
| **VELDDRIF** | | | | | | | | | | | | |
| 4. Globe Engineering Works 022 783 1180 | Manufacturing | - | No hazardous waste generation | - | - | - | - | - | - | - | - | - |
| 5. Houtkis 022 783 0326 | Cabinet making | - | No hazardous waste generation | - | - | - | - | - | - | - | - | - |

| KEY INDUSTRY 3 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIKETBERG** | | | | | | | | | | | | |
| 1. Vellestoor Cannot establish contact | - | - | - | - | - | - | - | - | - | - | - | - |
| **PORTERVILLE** | | | | | | | | | | | | |
| NONE | - | - | - | - | - | - | - | - | - | - | - | - |
| **VELDDRIF** | | | | | | | | | | | | |
| NONE | - | - | - | - | - | - | - | - | - | - | - | - |

| KEY INDUSTRY 5 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIKETBERG** | | | | | | | | | | | | |
| 1. Piketberg Drukkers Marianna Kirsten 022 913 1679 | Printing and refilling of printers | 3 | Spent thinners | 0.2 | - | - | - | - | - | - | - | Evaporates. |
| **PORTERVILLE** | | | | | | | | | | | | |

| KEY INDUSTRY 5 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2. Office World<br>022 931 3365<br>Number does not exist | **-** | - | - | - | - | - | - | - | - | - | - | **-** |
| **VELDDRIF** | | | | | | | | | | | | |
| 3. Bergriver Sun<br>022 783 0065 | **Only distribution. Printing by Paarl Post.** | - | No hazardous waste generated | - | - | - | - | - | - | - | - | **-** |
| 4. Durado Graphics<br>022 783 7677<br>Number does not exist | **-** | - | - | - | - | - | - | - | - | - | - | **-** |

| KEY INDUSTRY 7 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIKETBERG** | | | | | | | | | | | | |
| 5. Piket Glas & Kaste<br>022 913 3137<br>Deon Pienaar | Glass cutting | **-** | No hazardous waste generation | - | 7.2 | - | - | - | - | - | - | No glass is manufactured on site; only cut to size. Broken window glass cannot be recycled as it contains too much chemicals. It is therefore stored until enough has been collected to transport to the Refuse Transfer Station where it is dumped in a container. Some golfcourses also request the glass to use as part of the construction of their greens. |
| **PORTERVILLE** | | | | | | | | | | | | |
| NONE | - | - | - | - | - | - | - | - | - | - | - | - |
| VELDDRIF | | | | | | | | | | | | |
| NONE | - | - | - | - | - | - | - | - | - | - | - | - |

| KEY INDUSTRY 9 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIKETBERG** | | | | | | | | | | | | |
| NONE | - | - | - | - | - | - | - | - | - | - | - | - |
| **PORTERVILLE** | | | | | | | | | | | | |
| NONE | - | - | - | - | - | - | - | - | - | - | - | - |
| VELDDRIF | | | | | | | | | | | | |
| 1. Wesbarn CC – Paint and Resin<br>022 783 1051<br>Number does not exist | - | - | - | - | - | - | - | - | - | - | - | - |
| 2. Westcoast Paints<br>Jenny Fourie<br>022 783 2023 | Sale of paint | **-** | No hazardous waste generation – sales only | | | | | | | | | Only sales.<br>Paint cans become property of buyer.<br>There is never any expired stock. |

| KEY INDUSTRY 11 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIKETBERG** | | | | | | | | | | | | |
| 1. Piketberg Engineering<br>Mnr Visser<br>022 913 1214 | Scrap metals and steel – turners of steel | - | No hazardous waste generation | - | - | - | - | - | - | - | - | Do not manufacture the steel themselves. Scrap metals are sold to a scrapyard. |
| 2. Louisco Ingenieurswerke<br>022 913 3733<br>Number does not exist | - | - | - | - | - | - | - | - | - | - | - | - |
| 3. Piket Implemente<br>Miena (H&SO)<br>022 913 2435<br>miena@piket.co.za | Turners of steel | 2 | Used Thinners | 0.1 | - | - | - | - | - | Recycle | Indy Oil and Go Green | No steel manufacturing. |
| 4. Fibrosteel<br>022 913 2927<br>Number does not exist | - | - | - | - | - | - | - | - | - | - | - | - |
| 5. Piketberg Power Tools<br>Mr Chris Watson<br>022 913 3957 | Servicing and repairs of power tools and electric equipment | 6 | Motor/engine oil | 0.2 | - | - | - | - | - | Recycled | Independent contractor comes to collect | Oil – engine oil. There are various entities collecting engine oil; the producer receives a certificate indicating safe disposal but they sell to Warwick Patay. Approximately 210 liters of engine oil per year (drum). |
| **PORTERVILLE** | | | | | | | | | | | | |
| 6. G van Wyk Ingenieurswerke<br>Gerrit van Wyk<br>083 285 3938<br>022 931 3262 | Engineering works | 6 | Motor/engine oil | 0.2 | - | - | - | - | - | Recycled | Independent contractor comes to collect | Do not manufacture the steel themselves.<br>They sell motoroil to Warwick Patay when necessary (approximately 1 x 210 liter drum per year) |
| **VELDDRIF** | | | | | | | | | | | | |
| 7. Aluman Cape CC (aluminium fabricator)<br>022 783 2085/7<br>Number does not exist | - | - | - | - | - | - | - | - | - | - | - | - |
| 8. La Likhala's Steelworks<br>Charl La Cock<br>082 614 6468 | Steel Manufacturing | - | No hazardous waste generated | - | - | - | - | - | - | - | - | Manufacturing of steel, but no waste. Sell offcuts to scrapyard and clean the workshop with normal detergents. No oils, no chemicals, no galvanising, no acids or solvents used. |
| 9. Steel at Velddrif (Pty) Ltd<br>022 783 0594 | Sale of steel | - | No hazardous waste generated – sales only | - | - | - | - | - | - | - | - | Only sell steel, no manufacturing. |
| 10. AWS Konstruksie<br>022 783 1040 | Construction activities | - | No hazardous waste generation | - | - | - | - | - | - | - | - | - |
| 11. JSB Fiberglass<br>022 783 0341<br>Cannot establish contact | - | - | - | - | - | - | - | - | - | - | - | - |

| KEY INDUSTRY 12 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIKETBERG** | | | | | | | | | | | | |

| KEY INDUSTRY 12 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Trentyre<br>022 913 2901<br>Number does not exist | Sale of tyres | - | - | - | - | - | - | - | - | - | - | |
| 2. NQF Vervoer<br>022 913 1616 | Transport | 6 | Spent Oil | 0.2 | - | - | - | - | - | Recycled | Collection by Oilkol | Oilkol collects, very little oil as servicing is mostly done off site. One 210 liter drum per year. |
| 3. Potgieter Transport<br>022 913 1735<br>Alwyn van Deventer | Transport | 6 | Spent Oil | 2.2 | | - | - | - | - | Recycled | Collected by LA Fuels | LA Fuels collects about 1 x 210 liter drum per month |
| | | 9 | Old Tyres | - | 3.6 | - | - | - | - | Recycled | Own transport | Old Tyres are taken to N7 Tyres for recycling (approximately 30 per month) |
| 4. Agrivaria<br>022 913 1055<br>Number does not exist | Sale of agricultural items | - | - | - | - | - | - | - | - | - | - | - |
| 5. Swartland Plaasdienste<br>022 913 2119<br>Number does not exist | Sale of agricultural items | - | - | - | - | - | - | - | - | - | - | - |
| 6. Andrag Agrico<br>022 913 1142<br>Evert Grobbellaar | Manufacturing of PVC pipes | - | No hazardous waste generated | - | - | - | - | - | - | - | - | No hazardous waste generated during the process and vehicles not serviced on site. |
| 7. Midas Motolek<br>022 913 1939 | Workshop | 6 | Spent Oil | 4.2 | | - | - | - | - | Recycled | Collected by Oilkol | Oilkol collects about 2 x 210 liter drums per month |
| 8. Sauer Garage Transport<br>022 913 4217<br>Number does not exist | | | | | | | | | | | | |
| 9. Swartland Suzuki<br>022 913 3444 | Vehicle Sales | | Sales only, no hazardous waste generation | - | - | - | - | - | - | - | - | - |
| 10. Van Zyl's Garage<br>022 913 2385<br>Number does not exist | - | - | - | - | - | - | - | - | - | - | - | - |
| 11. Piketberg Bandediens BK<br>022 913 3582<br>Leon Visser | Sale of tyres | 9 | Old tyres | - | 23.0 | - | - | - | - | Recycle | REDISA collects | REDISA collects the tyres – approximately 190 per month. |
| 12. Bothma Motorbakwerke<br>021 913 1645<br>Mr Christo Bothma | Spraypainting and panelbeating of motor vehicles | 6 | Spent Oil | 0.2 | - | - | - | - | - | Recycle | Oilkol collects | Oilkol collects approximately 1 x 210 liter drum per year. |
| | | 3 | Used Thinners | 0.2 | - | - | - | - | - | Recycle | Oilkol collects | Oilkol collects approximately 1 x 210 liter drum per year. |
| 13. Build-it<br>022 913 1950<br>Gerhard Steenkamp | Servicing of machinery | 6 | Spent oil | 0.2 | - | - | - | - | - | Recycle | Oilkol collects | Oilkol collects, very little oil as servicing is mostly done off site. One 210 liter drum per year. |
| **PORTERVILLE** | | | | | | | | | | | | |
| 14. SP Herstelwerke<br>022 931 2453 | - | - | - | - | - | - | - | - | - | - | - | - |

| KEY INDUSTRY 12 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number does not exist | | | | | | | | | | | | |
| 15. Hi–Q<br>022 931 2105/3670<br>Mr Louw | Sale of tyres | 9 | Old tyres | - | 25.0 | - | - | - | - | Recycle | REDISA collects | REDISA collects the tyres – approximately 220 per month. |
| 16. Laubscher's Garages<br>022 931 2181 | Vehicle Sales | - | Sales only, no hazardous waste generation | - | - | - | - | - | - | - | - | - |
| 17. Porterville Tyre & Exhaust<br>022 931 3314<br>Henri Smit | Exhaust and tyre sales and fitment | 6 | Spent Oil | - | 0.96 | - | - | - | - | Recycled | Collected by independent contractor | Warwick Patay collects about 80 liters per month |
| | | 9 | Old Tyres | - | 1.8 | - | - | - | - | Recycled | Own transport | Old Tyres collected by REDISA (50 to 100 per month) |
| 18. Wilbo Onderdele<br>022 931 3477<br>Frankie Daniels | Motor vehicle parts sale | - | Sales only, no hazardous waste generation | - | - | - | - | - | - | - | - | - |
| 19. Ash Bakwerke<br>022 931 3240<br>Mr Mario Vermeulen | Spraypainting and panelbeating of motor vehicles | - | No hazardous waste generated | - | - | - | - | - | - | - | - | No motor oils and thinners are put through recycling machine a couple of times until it is just powder. |
| 20. Porterville Body Work<br>022 931 2670<br>Mr Steven Horn | Spraypainting and panelbeating of motor vehicles | - | No hazardous waste generated | - | - | - | - | - | - | - | - | No motor oils and thinners are put through recycling machine a couple of times until it is just powder. |
| **VELDDRIF** | | | | | | | | | | | | |
| 21. Bergrivier Meganies<br>022 783 1207<br>Worsie Botha | Servicing of motor vehicles | 6 | Motor oil | 2.6 – 15.6 | - | - | - | - | - | Recycle | Oilkol collects | Oilkol collects oil once per month ranging between 50 – 300 liters as well as Oil filter (approximately 120 per month)<br>Farmers collect tyres |
| | | 6 | Oil filters | - | 1.5 | - | - | - | - | Recycle | Oilkol collects | |
| | | 9 | Tyres | | 1.0 | - | - | - | - | Reuse | Farmers collect | |
| 22. Bergrivier Motors: Petrol Station<br>022 783 0946<br>Chrystal Galant | Fuel station | 6 | Empty oil containers | - | 3.0 | - | - | x | - | - | - | No hazardous waste except for empty motor oil containers – gets put into the normal refuse for removal by Municipality (approximately 15 per day) |

| KEY INDUSTRY 14 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIKETBERG** | | | | | | | | | | | | |
| 1. Telkom Tegniese Dienste<br>022 913 1900<br>Me Marieta Smit | Servicing of Telkom lines | - | No hazardous waste generation | - | - | - | - | - | - | - | - | - |
| **PORTERVILLE** | | | | | | | | | | | | |
| NONE | - | - | - | - | - | - | - | - | - | - | - | - |
| **VELDDRIF** | | | | | | | | | | | | |
| 2. Mariba Engineering<br>022 783 0287<br>Cannot establish contact | - | - | - | - | - | - | - | - | - | - | - | - |

| KEY INDUSTRY<br>15 | PROCESS GENERATING WASTE | SANS 0228 | MAJOR CONSTITUENT PER WASTE STREAM | QUAN-TITY M3/A | QUAN-TITY T/A | SEWER NO PT | SEWER PT | LANDFILL | OTHER FINAL DISPOSAL | REUSE RECYCLE | TRANSPORT CONTRACTOR | NOTES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **PIKETBERG** | | | | | | | | | | | | |
| 1. PPC Cement De Hoek Environmental Department<br>Lushca Hendricks – Environmental Practitioner<br>022 913 8431<br>lushca.hendrick@ppc.co.za | Mining Processing and Production of Cement | ? | Various – see notes | - | Disposed: 50<br><br>Recycled: 350 | - | - | x | - | Recycle | Averda: HCRW, Oil/Water Mix, Oil Contaminated Waste<br>FFS: Spent Oil<br>Spent Oil<br>Reclite: Fluorescent tubes and other lighting equipment<br>Focus Asbestos: Asbestos contaminated material<br>Green Office: Printer Cartridges<br>Retromin: Refractories | Total consists of:<br>1. HCRW<br>2. Oil/Water Mix<br>3. Oil Contaminated Waste<br>4. Spent Oil<br>5. Fluorescent tubes and other lighting equipment<br>6. Asbestos contaminated material<br>7. Printer Cartridges<br>8. Refractories |
| 2. Fick Cement Works<br>022 913 1921<br>Mnr Anton Fick | Manufacturing of cement | - | No hazardous waste generation | - | - | - | - | - | - | - | - | No contaminated waste or waste water. All water is used during manufacturing process, no excess. |
| **PORTERVILLE** | | | | | | | | | | | | |
| NONE | - | - | - | - | - | - | - | - | - | - | - | - |
| **VELDDRIF** | | | | | | | | | | | | |
| NONE | - | - | - | - | - | - | - | - | - | - | - | - |

| KEY INDUSTRY<br>16 | SERVICE PROVIDER | WASTE TYPE<br>VOLUME/MASS PER ANNUM | NOTES |
|---|---|---|---|
| **PIKETBERG** | | | |
| **VIII. HOSPITALS** | | | |
| Radie Kotze Hospital<br>Me Berta Smith<br>022 913 1175<br>Berta.smith@westerncape.gov.za | Averda | Sharps: ± 0.44 tons/annum<br>Infectious Waste: ± 6.3 tons/annum<br>Pharmaceutical Waste: ± .06 tons/annum<br>Anatomical Waste: ± 0.32 tons/annum | Averda collects once per week from the Hospital. They used to incinerate on site but this is no longer done. |
| **IX. CLINICS** | | | |
| **i. Private Clinics** | | | |
| Piketberg Medical Centre<br>(Dr Scheepers and Partners)<br>Ms Magdalena Mostert<br>022 913 1146<br>rekeninge@pmsdokters.co.za | Compass Medical Waste Services | Sharps: ± .04 tons/annum<br>Infectious Waste: ± 0.1 tons/annum<br>Pharmaceutical Waste: Quantity unknown | The Centre has recently changed from Solid Waste Technologies as service provider to Compass Medical Waste Services. Dr Bruwer and Scheepers handle their HCRW separately but it is removed simultaneously bi-monthly. |
| **ii. Municipal Clinics** | | | |
| NONE | | | |
| **iii. District Clinics** | | | |

| KEY INDUSTRY<br>16 | SERVICE PROVIDER | WASTE TYPE<br>VOLUME/MASS PER ANNUM | NOTES |
|---|---|---|---|
| Piketberg Clinic<br>Sister Marietjie Brits<br>022 913 1660 | Averda | Sharps: ± 1200 litre/annum<br>Infectious Waste: ± 3600 litre/annum<br>Pharmaceutical Waste: Quantity unknown | The waste is generated at Piketberg Clinic as well as 6 x satellite clinics and 1 x mobile clinic.<br>Sharps: The Clinic has 10 x 5 litre sharps containers which are removed twice per month by Averda.<br>Infectious Waste: The Clinic has 3 x 50 litre boces that are removed twice per month by Averda<br>Pharmaceuticals are also collected on an Ad Hoc basis (mostly expired)<br>All medical waste is stored in a dedicated medical waste room until collection. |
| **iv. Industrial Clinics** | | | |
| PPC Cement de Hoek<br>Sister Lesch<br>022 913 8237 | Averda | Sharps: ± 60 litre/annum<br>Infectious Waste: ± 800 litre/annum<br>Pharmaceutical Waste: ± 130 litre/annum | Averda is requested to collect as soon as the containers are filled – no formal routine.<br>The clinic has 1 x 7.6 litre sharps container (weighed 1.25 kg on 18 May 2018 and 1.25kg on 6 July 2018.<br>The clinic has 2 x 50 litre boxes for disposal of infectious waste (bandages, bloody items, sugar and iron tests) in one and lung function test filters in the other (weighed 6.4 kg on 18 May 2018 and 8.15kg on 6 July 2018 combined).<br>The clinic has 1 x 20 litre green container for expired pharmaceuticals collected 6 to 7 times per year. |
| **v. Pharmacies with Clinics** | | | |
| Piketberg Apteek<br>Sister Linette Verkuil<br>022 913 1600 / 072 457 6612<br>Could not establish contact | | | |
| **X. MORTUARIES AND FUNERAL PARLOURS** | | | |
| Avbob<br>Ms Ronel van Zyl<br>083 952 4512<br>022 913 1315<br>piketberg@funeral.avbob.co.za | Compass Medical Waste Services | Sharps: None<br>Infectious Waste: ± 240 litre/annum | Avbob has 1 x 20 litre box for infectious waste which is removed once per month by Compass Medical Waste Services. |
| Carstens Begrafnisondernemers<br>Mr Johan Carstens<br>022 913 1748<br>Mr Gerhard Carstens<br>082 389 4885<br>carstenspiket@gmail.com | Averda | Sharps: None<br>Infectious Waste: ± 200 litre/annum | Carstens Begrafnisondernemers has 1 x 50 litre box for infectious waste which is removed every three months by Averda. |
| Seder Ontwikkeling & Bystandsdienste<br>Mr Davids<br>022 913 1474<br>083 726 6917<br>wmninsurance@gmail.com | None | Sharps: None<br>Infectious Waste: Unknown | No waste removal company is appointed. All gloves, masks, nappies, bandages, clothes and anatomical waste is placed in a plastic bag and put into the coffin with the deceased and buried. |
| **XI. OLD AGE HOMES** | | | |
| AJ Liebenberg Old Age Home<br>Sister Grobbelaar<br>022 913 1228 | Averda | Sharps: ± 60 litre/annum<br>Infectious Waste: ± 1200 litre/annum | AJ Liebenberg Old Age Home has 1 x 5 litre sharps container removed once per month by Averda.<br>They also have 2 x 50 liter boxes which are removed once per month (30 kg in total).<br>All diapers are disposed of via the normal municipal refuse collection system. |
| **XII. GENERAL PRACTITIONERS** | | | |
| Drs BF Smit and W de Villiers; Morrison Nursing Aid<br>Ms Barbara Abdhuraman<br>022 913 1172 | Averda | Sharps: ± 80 litre/annum<br>Infectious Waste: ± 1800 litre/annum | They have 8 x 6.2 litre sharps containers emptied into 2 x 20 litre containers which are removed every six months.<br>They also have 3 x 50 liter boxes for infectious waste removed once per month. |
| Drs Scheepers and Partners<br>(Refer to Piketberg Medical Centre) | | | |
| **XIII. VETERINARY SERVICES** | | | |
| Piketberg Animal Hospital<br>Nadine de Waal<br>022 913 1148<br>piketberganimalhosp@telkomsa.net | BCL Medical Waste | Sharps: Unknown<br>Infectious Waste: Unknown<br>Caracasses: Unknown | |

| KEY INDUSTRY<br>16 | SERVICE PROVIDER | WASTE TYPE<br>VOLUME/MASS PER ANNUM | NOTES |
|---|---|---|---|
| E-mail sent, no response received. | | | |
| State Veterinarian<br>Mr Hendrik Hagen<br>082 896 9570 | Own transport | Sharps: ± 80 litre/annum<br>Infectious Waste: ± 120 litre/annum<br>Carcasses: None | Mr Hagen transports all medical waste to the to Malmesbury Magistrate's Court.<br>He has 1 x 20 litre sharps container emptied every 3 months.<br>He has 1 x 20 litre infectious waste container emptied every second month.<br>He does not deal with carcasses at all. |
| **XIV. DENTISTS** | | | |
| Dr Harold Truter<br>Ms Maria Adams<br>022 913 1630 | Averda | Sharps: ± 180 litre/annum<br>Infectious Waste: ± 240 litre/annum | The amount of waste quoted is from this practice in Piketberg as well from one in Velddrif where the dentist works once or twice per month. It also includes a mobile practice in Citrusdal. All waste is transported to Piketberg.<br>The practice has 3 x 5 litre sharps container.<br>It also has 3 x 5 litre container for empty ampoules.<br>They also have 3 x 50 litre box for infectious waste including teeth.<br>Averda collects waste once per month which usually includes 3 x 5 liter sharps containers, 1 x 20 liter infectious waste box. |
| **XV. SANITARY SERVICES** | | | |
| NONE | | | |
| **XVI. TATTOO PARLOURS** | | | |
| NONE | | | |
| **PORTERVILLE** | | | |
| **VII. HOSPITALS** | | | |
| Lapa Munnick Hospital<br>Sister Adonis<br>022 931 2140 | Averda | Sharps: ± 480 litre/annum<br>Infectious Waste: ± 72 000 litre/annum<br>Pharmaceutical Waste: ± 20 litre/annum<br>Anatomical Waste: ± 120 litre/annum | 2 – 5 x 5 litre sharps containers are removed every second week.<br>The hospital has 50 litre and 142 litre boxes for infectious waste and approximately 30 boxes are removed every two weeks in total (some 50 litres and some 142 litres).<br>For anatomical waste the hospital has 1 x 10 litre bucket which is removed once monthly.<br>For Pharmaceutical waste the hospital has 1 x 10 litre bucket removed every six months. |
| Voorberg Correctional Services<br>Sister Pienaar<br>022 931 8000<br>022 931 8044/8189/8046 | Barker Hygiene | Sharps: ± 240 litre/annum<br>Infectious and Anatomical Waste:<br>± 2400 litre/annum | The correctional facility has 4 x 5 litre sharps containers which is removed monthly.<br>Approximately 4 to 5 x 50 litre boxes with infectious and anatomical waste is removed monthly. Anatomical waste is generated from male circumcision which is carried out on a monthly basis. |
| **VIII. CLINICS** | | | |
| **ii. Private Clinics** | | | |
| NONE | | | |
| **iii. Municipal Clinics** | | | |
| NONE | | | |
| **iv. District Clinics** | | | |
| Porterville District Clinic<br>022 931 2711<br>Including mobile clinic<br>Could not establish contact | | | |
| **v. Industrial Clinics** | | | |
| NONE | | | |
| **vi. Pharmacies with Clinics** | | | |
| Porterville Gesondheidssentrum<br>Ms Monique Benn<br>022 931 2121<br>zeldaherbst@gmail.com | Solid Waste Technologies | Sharps: ± 43 litre/annum<br>Infectious Waste: ± 60 litre/annum | Waste is removed approximately three times per year.<br>The Centre has 2 x 7.2 liter sharps containers and 1 x 20 liter infectious waste container. |
| **IX. MORTUARIES AND FUNERAL PARLOURS** | | | |
| Valley Funerals<br>086 082 5539 | N/A | Sharps: None<br>Infectious Waste: None | This is not a funeral parlour in Porterville, just an office. |
| **X. OLD AGE HOMES** | | | |

| KEY INDUSTRY<br>16 | SERVICE PROVIDER | WASTE TYPE<br>VOLUME/MASS PER ANNUM | NOTES |
|---|---|---|---|
| Huis Nerina<br>Sister van der Westhuizen<br>022 931 2695 | Cannon Hygiene | Sharps: ± 20 litre/annum<br>Infectious Waste: ± 600 litre/annum | They have 1 x 5 liter sharps container removed every three months.<br>They have 1 x 50 liter infectious waste box removed every month.<br>All diapers are collected by Municipal vehicles forming part of the household waste fraction. |
| **XI. GENERAL PRACTITIONERS** | | | |
| Drs P Nell and E Wilson<br>Penny Brand<br>022 931 2155 | Hygiene Elite | Sharps: ± 172 litre/annum<br>Infectious Waste: ± 430 litre/annum | Waste is removed once every six weeks by Hygiene Elite.<br>They have 1 x 20 litre sharps container and 1 x 50 litre box for infectious waste. |
| Dr Botha<br>(previously Dr Noeth's practice)<br>Ms Wilma Crafford<br>022 931 2172 | Averda | Sharps: ± 18 litre/annum<br>Infectious Waste: ± 200 litre/annum | The rooms have 3 x 1.5 litre sharps containers removed once in three months as well as 1 x 50 litre infectious waste box. |
| **XII. VETERINARY SERVICES** | | | |
| Berg River Animal Consulting Room<br>Drs Triegaard and Trollope<br>Charlene Plain<br>023 230 0123 | BCL Medical Waste | Sharps: ± 120 litre/annum<br>Anatomical: ± 120 litre/annum | The rooms have 1 x 5 litre sharps container removed bi-weekly and well as 1 x 5 litre bucket for anatomical waste. |
| **XIII. DENTISTS** | | | |
| Dr SE Kotze and van Wyk<br>Ms Rachel Daniels<br>022 931 2760 | Hygiene Elite | Sharps: ± 30 litre/annum<br>Infectious Waste: ± 120 litre/annum | Waste is removed every second month and the practice has 1 x 5 litre sharps container as well as 1 x 20 litre box for infectious waste. They are the only dentistry in town. |
| **XIV. SANITARY SERVICES** | | | |
| NONE | | | |
| **XV. TATTOO PARLOURS** | | | |
| **VELDDRIF** | | | |
| **VI. HOSPITALS** | | | |
| NONE | | | |
| **VII. CLINICS** | | | |
| **iv. Private Clinics** | | | |
| Jacqui Health Care Clinic<br>Jacqueline Mostert<br>022 783 0786 | Averda | Sharps: ± 7.6 litre/annum<br>Infectious Waste: ± 40 litre/annum | The Clinic has 1 x 7.6 litre sharps container which is removed once per year. It also has 2 x 20 liter boxes for empty ampoules removed once per year. |
| **v. Municipal Clinics** | | | |
| NONE | | | |
| **vi. District Clinics** | | | |
| Velddrif Clinic<br>Sister Nel<br>022 814 0142 | Averda | Sharps: ± 600 litre/annum<br>Infectious Waste: ± 8100 litre/annum<br>Pharmaceutical Waste: ± 80 litre/annum | The Clinic has 10 x 5 litre sharps containers, 5 full containers are removed every second week.<br>They also have 50 liter and 142 litre boxes for infectious waste of which 5 x 50 litre and 3 x 142 litres are removed monthly.<br>Pharmaceuticals: 1 x 20 litre green bucket is removed every 3 months. |
| **vii. Industrial Clinics** | | | |
| NONE | | | |
| **viii. Pharmacies With Clinics** | | | |
| Brug Apteek<br>Mr Johan Moolman<br>022 783 0424 | BCL Medical Waste | Sharps: ± 240 litre/annum<br>Infectious Waste: ± 600 litre/annum | The Clinic has 1 x 20 litre sharps container which is emptied once per month.<br>They also have 1 x 50 litre box for infectious waste which is emptied once per month. |
| **VIII. MORTUARIES AND FUNERAL PARLOURS** | | | |
| None | | | |
| **IX. OLD AGE HOMES** | | | |
| Aanoewer Tuisversorging<br>Ms Hanneke | N/A | Sharps: None<br>Infectious Waste: None | They no longer form part of the Department of Health so they have scaled down tremendously and do not generate any HCRW. |

| KEY INDUSTRY<br>16 | SERVICE PROVIDER | WASTE TYPE<br>VOLUME/MASS PER ANNUM | NOTES |
|---|---|---|---|
| 022 783 0048 | | Pharmaceutical Waste: None | |
| **X. GENERAL PRACTITIONERS** | | | |
| Dr S Annandale<br>Ms Bianca Venter<br>022 783 0040 | Own transport | Sharps: Unknown<br>Infectious Waste: Unknown<br>Pharmaceutical Waste: Unknown | Dr Annandale has a private arrangement with the WestCoars Life Private Hospital in Vredenburg. He transports all of the sharps and infectious waste to the hospital once per month in order for it to form part of their waste disposal. |
| Dr N Vermeulen<br>Ms Elta Lourens<br>022 783 0027 | Averda | Sharps: ± 137 litre/annum<br>Infectious Waste: ± 300 litre/annum | The practice has a 3 x 7.6 litre sharps containers as well as 1 x 50 litre box for infectious waste which are collected every second month.<br><br>**From the procedure room all infectious waste is thrown into the normal refuse bin to form part of Municipal Collections.** |
| **XI. VETERINARY SERVICES** | | | |
| Velddrif Animal Clinic<br>Celia Gildenhuys<br>074 740 1111 | | Sharps: Unknown<br>Infectious Waste: Unknown<br>Carcasses: None | This clinic only treats mange with injections. Needles are taken to Vredenburg Veterinarians as well as to Doctor Dorette at Green Acres. When veterinarians come to the clinic to do sterilisations they also take the anatomical and infectious waste with them when they leave. |
| **XII. DENTISTS** | | | |
| Drs CP Steyn & Ryke<br>022 783 0747<br>Number does not exist | - | - | - |
| Dr HD Boock<br>022 783 0747<br>Number does not exist | - | - | - |
| **XIII. SANITARY SERVICES** | | | |
| None | | | |
| **XIV. IX. TATTOO PARLOURS** | | | |
| None | | | |