OVERBERG DISTRICT MUNICIPALITY

INTEGRATED WASTE MANAGEMENT PLAN
(3rd Generation)

(*Draft Report*)

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OVERBERG DISTRICT MUNICIPALITY

INTEGRATED WASTE MANAGEMENT PLAN

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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
KPI	Key Performance Indicator
LDPE	Low Density Polyethylene
MEC	Member of the Executive Council
MRF	Material Recovery Facility
MSA	Municipal Systems Act
NDP	National Development Plan
NWMS	National Waste Management Strategy
NU	Non-urban
ODM	Overberg District Municipality
PET	Polyethylene terephthalate
PVC	Polyvinyl Chloride
SAWIS	South African Waste Information System
SDF	Spatial Development Framework
SP	Sub-place
WCS	Waste Characterisation Study
WCPSDF	Western Cape Provincial Spatial Development Framework
WMO	Waste Management Officer
WWTW	Waste Water Treatment Works

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OVERBERG DISTRICT MUNICIPALITY

INTEGRATED WASTE MANAGEMENT PLAN

THIRD GENERATION

EXECUTIVE SUMMARY

INTRODUCTION AND GENERAL DESCRIPTION

The third generation of this Integrated Waste Management Plan (IWMP) has been formulated by JPCE (Pty) Ltd on behalf of the Overberg District Municipality. The second generation IWMP was developed in 2012 and was subsequently commented on and evaluated by the Department: Environmental Affairs and Development Planning (DEADP). This update incorporates the comments and recommendations made on the 2012 IWMP as well as the latest checklist for IWMPs by the DEADP.

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 that has as its goal the transformation of the current methodology of waste management, i.e. 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 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 and the National Waste Management Strategy (NWMS 2011).

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 Overberg District.

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 1.7 and the demographic details in section 3.2. The current population estimate of the Overberg District is 276 994 people, based on the Census 2011 population of each local Municipality 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 2012 IWMP.

WASTE QUANTITIES AND TYPES

Weighbridge data from the ODM Karwyderskraal Landfill was used, and for the municipalities where weighbridge information was not available, the totals were estimated from using waste generation rates per capita and applied to current and future estimated population figures.

The total waste for the District for 2018 was estimated at 71 798.60 tonnes with a future estimated total of 72 526.91 tonnes for 2019. This equates to an average waste generation factor of 0.75 kg/person/day. Waste characterisation was based on the 2007 study by the DEADP. The percentages and estimated total recyclables are shown below:

Municipality	PAPER/ CARD (t/a)	PLASTICS (t/a)	GLASS (t/a)	METAL (t/a)	ORGANICS (t/a)	OTHER (t/a)	TOTAL (t/a)
Overstrand	4 688	3 047	1 406	938	3 985	9 376	23 440
Cape Agulhas	2 071	941	471	565	2 260	3 107	9 415
Swellendam	2 468	2 073	987	296	3 159	888	9 871
Theewaterskloof	6 105	4 070	1 454	872	3 489	13 082	29 072
TOTAL	**15 332**	**10 132**	**4 318**	**2 671**	**12 892**	**26 454**	**71 799**
(as percentage)	21%	14%	6%	4%	18%	37%	100%

WASTE COLLECTION

The District does not render waste collection services as this is a function of the Local Municipalities. The IWMP gives a summary of each Local Municipal solid waste collection service and the level of free basic services rendered.

WASTE MANAGEMENT FACILITIES

The District owns and operates one landfill facility, called Karwyderskraal Landfill located near Hermanus in the Overstrand local municipality, and all identified waste management facilities such as transfer stations, disposal facilities and recycling facilities are discussed for each Local Municipality.

IDENTIFIED GAPS

The following gaps were identified in the District

- Public Awareness and Education
- Recycling and waste minimisation
- Lack of information regarding waste generation types and volumes
- Disposal sites (condition and operation) and lack of disposal airspace
- Funding Mechanisms

STRATEGIC OBJECTIVES

Being a District Municipality and not “owning” any waste, these strategies are more focussed on supporting the local municipalities with their individual strategies. Since the ODM does own the Karwyderskraal landfill the objectives are also aimed at developing strategies for sustainable waste management at the Karwyderskraal landfill facility. The District Municipality does not collect waste with the result that strategies for waste avoidance and waste reduction are not really applicable.

The Waste Management Strategic Objectives for Overberg District Municipality on which this plan is based, commits the municipality to:

- Create an atmosphere in which the environment and natural resources of the region are conserved and protected.

- Develop a communication/information/education strategy to help ensure acceptance of ‘ownership’ of the strategic objectives among members of the public and industry throughout the municipality and to promote co-operative community action.

- Provide solutions for the three main objectives:
  - The avoidance of waste generation
  - The reduction of waste volumes
  - The safe disposal of waste

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IMPLEMENTATION

The ODM IWMP has an implementation plan which is based on the four main goals of the Western Cape Provincial IWMP, each divided into a number of strategic objectives. These goals and objectives have each been divided into actions and years of implementation with estimated costs in order to achieve the main goals.

These goals and objectives are:

Goal 1: Strengthened education, capacity and advocacy towards Integrated Waste Management
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
Strategic Objective 1: Facilitate municipal waste management planning
Strategic Objective 2: Promote industry waste management planning
Strategic Objective 3: Promote the establishment of integrated waste management infrastructure and services
Strategic Objective 4: Ensure effective and efficient waste information management

Goal 3: Effective and efficient utilisation of resources
Strategic Objective 1: Minimise the consumption of natural resources
Strategic Objective 2: Stimulate job creation within the waste economy
Strategic Objective 3: Increase waste diversion through reuse, recovery and recycling

Goal 4: Improved compliance with environmental regulatory framework
Strategic Objective 1: Strengthen compliance monitoring and enforcement
Strategic Objective 2: Remediate and rehabilitate contaminated land
Strategic Objective 3: Facilitate the development of waste policy instruments
Strategic Objective 4: Promote self/co-regulatory measures

MONITORING AND REVIEW

The IWMP acts as a planning guide and requires regular updates and reviews in order to stay relevant, especially the projects for implementation. Each project must be reviewed to measure its success, shortcomings or reasons for failure. The IWMP must be updated to reflect the progress of projects or to adapt strategies. The review will also assist in budgeting for upcoming waste management projects.

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OVERBERG DISTRICT MUNICIPALITY

INTEGRATED WASTE MANAGEMENT PLAN

THIRD GENERATION

1. INTRODUCTION

1.1 TERMS OF REFERENCE

JPCE (Pty) Ltd (JPCE) has been appointed by the Overberg District Municipality (ODM) in the Western Cape Province to assist in developing their third generation Integrated Waste Management Plan (IWMP). The second generation IWMP was developed in 2012 and approved by Council on 27 May 2013. This third version IWMP will be developed during 2018 and will replace the May 2013, second 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 Provincial Department: 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 (MSA).

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 objectives 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 objectives 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 are further detailed by the DEADP IWMP guideline table of contents which are as follows. Only the main headings are shown here. Refer to **Annexure A** for the entire table. 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:
  - Legislative Requirements
  - 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 ODM 2nd generation IWMP was completed by Worley Parsons Consultants in 2012 and adopted by the ODM in May 2013 through council resolution A59. The provincial environmental authority of the Western Cape Government, (DEADP) prepared an assessment report of the 2nd generation IWMP in November 2012 where it provides feedback and recommendations on the IWMP. The IWMP received a 49.3% score in terms of fulfilment of the DEADP checklist and the recommendations in the assessment report are summarized in **Table 1-1** below with the full report given in **Annexure B**. The recommendations were based on the DEADP checklist applicable at the time of the 2nd generation IWMP and the checklist from the authority has since been updated as indicated earlier. This 3rd generation IWMP will aim to address the requirements of the latest checklist but will also aim to ensure that recommendations made on past IWMP reports are adequately covered.

Table 1-1: Overview of DEADP recommendations on 2nd Generation IWMP

Section	DEADP Assessment and Recommendation
Strategic Linkages	The plan needs to be aligned to the Provincial and Municipal Spatial Development Frameworks. Indications of what will be incorporated into the IDP need to be made clear.
Public Participation	No public participation was done. Please ensure that there is consultation with residents and other key stakeholders in order to ensure buy in of all parties. This consultation can happen together with the IDP consultation process.
Legislative Framework	All current and draft legislation pertaining to waste management within the municipalities need to be included. Legislation that has been repealed must not be included. An indication of existence of updated municipal by-laws must be listed for each municipality.
Demographic Profile	Accurate information based on latest published results for population densities, socio economic categories, income levels, expected population growth etc. must be included.
Waste Management Cost and Financing	Indicate financial resources available for capital and operational expenditure with regard to construction of new cell(s) at Karwyderskraal Landfill. The service level agreement (SLA) with municipalities must also be included and indicate the contribution per municipality towards the on-going running of the site.

Section	DEADP Assessment and Recommendation
Services and Service Delivery	An overview of the status of all waste management facilities e.g. transfer stations etc. should be included in the plan.
Licensing	Include a status of waste management environmental authorizations for all municipalities and indicate how the district will be assisting the local municipalities with compliance.
Waste Characterization and Projections	Information is out dated so recommend that local municipalities conduct waste characterization studies to assist district in obtaining a clear picture of waste in ODM. The plan needs to indicate how the district will be assisting the local municipalities with conducting waste characterization studies.
Organizational Structure and Staff Capacity	The organizational structure needs to be included in the plan. This is required to inform decision making regarding vacancies and training needs.
Waste awareness and education	The IWMP needs to indicate how the district will be encouraging and supporting the local municipalities with regard to waste management awareness and education.
Waste information management	Municipalities need to capture waste information on the DEADP waste calculator and IPWIS system which will allow them to manage their waste within the boundaries of the municipality
Gap/need identification	The ODM should explain how they intend to support the local municipalities to achieve their waste minimization initiatives in order to save landfill airspace.
Goals, objectives and targets	The goals and objectives of the ODM must be aligned with the mandates of the NWMS and the WC IWMP and must address the relevant gaps and needs as identified within the municipal IWMPs and in the district's IWMP Status Quo Analysis.
Implementation	An implementation strategy should be developed and should assign responsibility to various identified activities and stipulated timeframes. The implementation plan should also show who the IWMP will be linked to the IDP i.e. those projects that will be approved by council for funding through the IDP process.
Monitoring and review	The monitoring should be run parallel with the IDP process where outputs that are achieved are measured against planned outputs. The Municipal Systems Act, Act 32 of 2000, requires all municipalities to set targets, monitor and review performance based on indicators linked to their IDP.

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 an improved implementation schedule.

The Overberg District Municipality developed their first generation IWMP in 2007 which was replaced by the second generation IWMP in 2013. This IWMP is the third generation and will replace the 2013 IWMP.

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 and the National Waste Management Strategy (NWMS).

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 District Municipal IWMP includes an investigation into the current state of the solid waste management system of the Overberg District 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 district authority level and not local municipal level since the local municipalities are required to conduct their own IWMPs. 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 implementable. Inputs from the local municipalities that form part of the ODM will be sought and discussed to determine their needs and to align it with the functions of the ODM.

The waste types discussed are the following:

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

1.4 METHODOLOGY AND APPROACH TO THE IWMP

The planning phase of the third generation IWMP commenced by establishing who the stakeholders would be that would provide input into the development of the IWMP. Since this is a District Municipality IWMP the public participation process will be limited to consultations with the local municipalities and public comments will be incorporated through inputs by the local municipalities. As the governing authority, the Western Cape DEADP will also be consulted.

The stakeholders were confirmed as per

Table 1-2:

Table 1-2 : IWMP Key Stakeholders

Stakeholder	Function	Representative	Title
Western Cape Department of Environmental Affairs and Development Planning	Commenting Authority	Mr. A Hoon, Mr. D Gilbert	
Overberg District Municipality	Owner and Custodian	Mr. F Kotze	Manager: Environmental Management Services
Cape Agulhas Local Municipality	Interested and Affected Party	Mr. W Linnert	Municipal Waste Manager
Overstrand Local Municipality	Interested and Affected Party	Mr. J van Taak	Municipal Waste Manager
Swellendam Local Municipality	Interested and Affected Party	Mr. B Burger*	Municipal Waste Manager
Theewaterskloof Local Municipality	Interested and Affected Party	Mr. H Marthinus	Municipal Waste Manager
JPCE (Pty) Ltd	Consultant, IWMP Author	Mr. R Pienaar, Mr. J Palm	Engineer

* Mr Burger is not the official municipal waste manager since the IDP indicates waste management responsibilities are delegated to the Director: Infrastructure Services. He was, however, the responsible and competent person at the time.

A project meeting was held at the DEADP's offices in Cape Town on 16 November 2017, which was attended by the consultants (Mr J. Palm and Mr W. Meyers), Mr A. Hoon and Mr D. Gilbert from the DEADP and Mr F. Kotze who is the Head: Environmental Management of the ODM. The purpose of the meeting was to discuss the scope of the project and the updating of the IWMP to the 3rd generation. The IWMP will follow the guidelines set by DEADP in their 2015/16 IWMP checklist (**Annexure A**). It must however be noted that the checklist was developed to assist the Local Municipalities with the development of their IWMP documents, and since the roles and functions of the district and local municipalities differ, the ODM IWMP was developed with the DEADP checklist as a guide only.

Meetings were also held with the Waste Managers of the four Local Municipalities that form the ODM in order to obtain their views on the functions of the ODM so that the needs of all parties involved could be aligned. During these meetings the local municipalities were requested to provide inputs into the functions of the ODM and to the IWMP as a whole. Feedback from these meetings were then included into the compilation of this IWMP document. Refer to **Table 2-1** for details.

1.5 OVERALL AIMS AND GOALS OF THE IWMP

The primary objective of integrated waste management 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 Overberg District.

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 district waste management – from waste prevention and minimisation (Waste avoidance), to its collection, storage, transport, treatment, recovery and final disposal as far as it relates to the District Municipality functions of such. 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 ODM IWMP are aligned with the goals of the most recent (2017) Western Cape Provincial IWMP, the 2011 NWMS, the ODM Spatial Development Framework (SDF) and the ODM Integrated Development Plan (IDP). These strategic linkages are shown in the **Table 1-4**. These main goals are shown in further detail and sub-goals and implementation items are given in **Section 5: Implementation and Strategy Plan** of the report.

It is important for the planning and decision making tools of the municipality to be aligned in order to ensure sustainable development of solutions. For that reason the ODM Integrated Development Plan (IDP) needs to incorporate the needs of spatial development and integrated waste management. According to the NWMS, all IWMPs had to be integrated into the IDPs of the municipalities as sector plans by 2016. The current state of development on the planning documents in question (for the ODM and its local Municipalities) are reflected in the table below.

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Table 1-3: Development Timeline of Municipal Planning Documentation

Municipality	Completion of Municipal Planning Documents (SDF, IWMP and IDP)															
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Theewaterskloof							IDP : 4th Review of 3rd Generation									
							SDF									
										ByLaw						
									IWMP							
Overstrand												IDP : Final of 4th Generation				
	SDF															
								ByLaw								
										IWMP						
Cape Agulhas							IDP: 4th Review of 3rd Generation									
							SDF									
	ByLaw															
											IWMP					
Swellendam												IDP : Final of 4th Generation				
			SDF													
										ByLaw						
										IWMP						
Overberg District												IDP : Draft of 4th Generation				
									SDF							
													IWMP			

Local Municipalities need to update their IWMP documents every 5 years in order to tie in with the development of the IDP. Waste management bylaws need to be updated regularly and included in the IWMPs of the local municipalities. The Overstrand and Cape Agulhas municipalities indicated that their waste bylaws are planned for updating during 2018.

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Table 1-4: Goals and Strategic Linkages

Western Cape IWMP (2016)	NDP 2030	NWMS (2011)	Western Cape SDF (2014)	ODM SDF (2014)	ODM (DRAFT) IDP 2017/2021
Goal 1: Strengthened education, capacity and advocacy towards Integrated Waste Management					
Strategic Objective 1.1: Facilitate consumer and industry responsibility in integrated waste management	Chapter 3: Develop proposals for an acceptable minimum standard of living and proposals on how to achieve this over time.	Goal 3: Grow the contribution of the waste sector to the green economy	Aim iii: Supports municipalities fulfil their municipal planning mandate in line with the national and Provincial agendas; and		Strategic Goal 1: To ensure the health and safety of all in the Overberg through the provision of efficient basic services and infrastructure.
Strategic Objective 1.2: Promote and ensure awareness and education of integrated waste management		Goal 4: Ensure that people are aware of the impact of waste on their health, well-being and the environment			
Strategic Objective 1.3: Build and strengthen waste management capacity	Chapter 3: Economy and Employment				Strategic Goal 3: To ensure municipal transformation and institutional development by creating a staff structure that would adhere to the principles of employment equity and promote skills development.

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Western Cape IWMP (2016)	NDP 2030	NWMS (2011)	Western Cape SDF (2014)	ODM SDF (2014)	ODM (DRAFT) IDP 2017/2021
Goal 2: Improved integrated waste management planning and implementation for efficient waste services and infrastructure					
Strategic Objective 2.1: Facilitate municipal waste management planning		Goal 5: Achieve integrated waste management planning			
Strategic Objective 2.2: Promote industry waste management planning					
Strategic Objective 2.3: Promote the establishment of integrated waste management infrastructure and services	Chapter 5: Environmental Sustainability and Resilience: Absolute reductions in the total volume of waste disposed to landfill each year.	Goal 2: Ensure the effective and efficient delivery of waste services Goal 1: Promote waste minimisation, re-use, recycling and recovery of waste	Aim ii: Serves as basis for coordinating, integrating and aligning 'on the ground' delivery of national and Provincial departmental programmes;	Smart Growth Principle 8: Utilize smarter, and cheaper infrastructure and green buildings and promote renewable and sustainable technologies to address the impacts of global warming and its effect on sustainable potable water resources;	Strategic Goal 1: To ensure the health and safety of all in the Overberg through the provision of efficient basic services and infrastructure.
Strategic Objective 2.4: Ensure effective and efficient waste information management					Strategic Goal 1: To ensure the health and safety of all in the Overberg through the provision of efficient basic services and infrastructure.

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Western Cape IWMP (2016)	NDP 2030	NWMS (2011)	Western Cape SDF (2014)	ODM SDF (2014)	ODM (DRAFT) IDP 2017/2021
Goal 3: Effective and efficient utilisation of resources					
Strategic Objective 3.1: Minimise the consumption of natural resources	Chapter 5: Environmental Sustainability and Resilience: Absolute reductions in the total volume of waste disposed to landfill each year.	Goal 3: Grow the contribution of the waste sector to the green economy		Vision: 'To optimize the rich and balanced mix of the Overberg's agriculture, tourism, heritage, conservation resources (including natural and scenic resources)and eco system services within their scenic setting…'	Strategic Goal 2: To promote regional economic development by supporting initiatives in the District for the development of a sustainable district economy.
Strategic Objective 3.2: Stimulate job creation within the waste economy					
Strategic Objective 3.3: Increase waste diversion through reuse, recovery and recycling		Goal 1: Promote waste minimisation, re-use, recycling and recovery of waste			

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Western Cape IWMP (2016)	NDP 2030	NWMS (2011)	Western Cape SDF (2014)	ODM SDF (2014)	ODM (DRAFT) IDP 2017/2021
Goal 4: Improved compliance with environmental regulatory framework					
Strategic Objective 4.1: Strengthen compliance monitoring and enforcement		Goal 8: Establish effective compliance with and enforcement of the Waste Act			Strategic Goal 5: To ensure good governance practices by providing a democratic and pro-active accountable government and encouraging community participation through existing IGR structures.
Strategic Objective 4.2: Remediate and rehabilitate contaminated land		Goal 7: Provide measures to remediate contaminated land			Strategic Goal 1: To ensure the health and safety of all in the Overberg through the provision of efficient basic services and infrastructure.
Strategic Objective 4.3 : Facilitate the development of waste policy instruments		Goal 6: Ensure sound budgeting and financial management for waste services			Strategic Goal 5: To ensure good governance practices by providing a democratic and pro-active accountable government and encouraging community participation through existing IGR structures.
Strategic Objective 4.4: Promote self/co-regulatory measures		Goal 2: Ensure the effective and efficient delivery of waste services			

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1.6 GEOGRAPHIC AREA OF STUDY

The Overberg District Municipality is a Category C municipality situated in the Western Cape Province, just over Sir Lowry's Pass to the southernmost tip of Africa. The adjacent municipalities are the Cape Winelands District to the north, Eden District to the east and City of Cape Town to the west. It is also bounded by the Indian Ocean to the south-west and Atlantic Ocean to the west.

The municipality is the smallest district in the province, making up only 9% of its geographical area. The following local municipalities form part of the Overberg region: Theewaterskloof, Swellendam, Overstrand and Cape Agulhas. The seat of the municipality is Bredasdorp and the ODM consists of 29 wards with a total geographical area of 12,128km^2.

Figure 1-1 shows the extent of the municipal area, major towns, roads and surface water features. Caledon, Swellendam, Bredasdorp and Hermanus are the main towns, and the Riviersonderend and Breede River and Theewaterskloof Dam are the main surface water features in the area.

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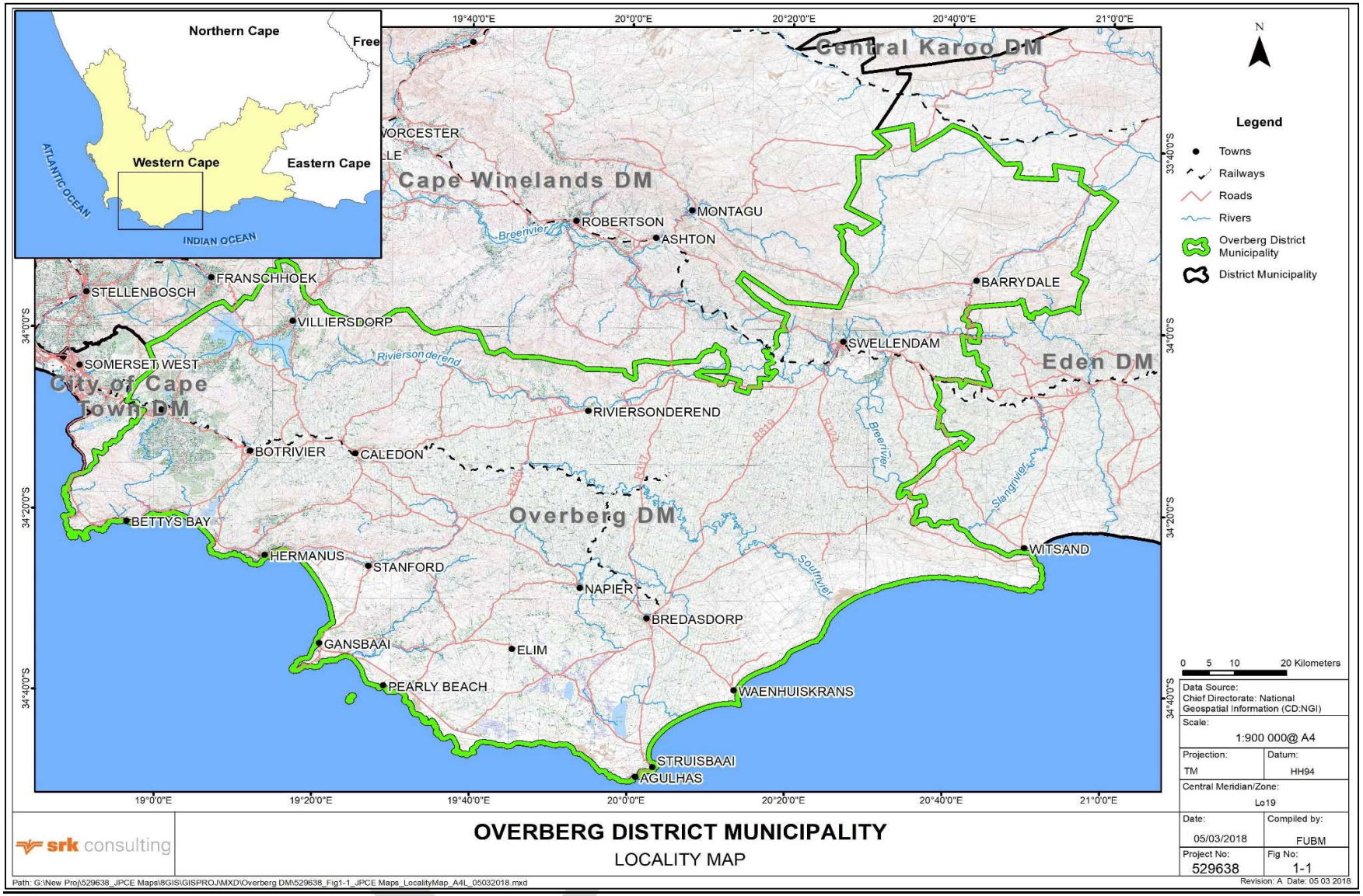

Figure 1-1: Study Area – Overberg District Municipal Area

1.6.1 Topography and climate

The municipal area consists of mountainous topography in the west and north and in general a coastal plain in the south. The area falls within the Western Cape Mediterranean climate zone and is known for its hot and dry summer days. Average annual rainfall, mainly during the winter months, is approximately 500 mm.

Winds are seasonal and generally North-west or South-east.

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 map Cape Town (Department of Water and Sanitation). There are eight geological formations present in the area. From oldest to youngest in age these are the Malmesbury, Table Mountain, Bokkeveld, Witteberg and Bredasdorp Groups, granites, the Enon Formation and superficial alluvial deposits.

The Malmesbury Group rocks are very old (>600 million years) and have been extensively deformed and reconstituted (metamorphosed). They comprise shale, phyllite and impure sandstones. They have been intruded in places by granitic rocks.

The Table Mountain Group (TMG) rocks consist predominantly of resistant quartzitic sandstones and form the characteristic grey, craggy mountains of the Western and Southern Cape. Two main formations are present, the upper Nardouw Subgroup and the lower Peninsula Sandstone Formation. These are separated by the Cedarberg Formation, a shaley more easily weathered horizon that forms a prominent green to brown (seasonal) marker band between the grey sandstones.

The Bokkeveld Group comprises a series of alternating fossiliferous shales and sandstones, with the former being more dominant, especially to the east. These rocks form the rolling wheatland areas typical of the Overberg.

The Witteberg Group also comprises alternating shales and sandstones but has a more quartzitic character. It is more resistant to weathering and thus forms more pronounced topography.
The Enon Formation comprises mainly boulders of TMG set in a clay matrix (conglomerate) and is present as isolated outliers, e.g. just south of Swellendam.

The Bredasdorp Group comprises a succession of sands, clays, limestones and calcarenites, with a basal conglomerate sporadically developed in channels in the underlying bedrock. It is developed along the coast, particularly at Walker Bay and between Struisbaai and Infanta. These sediments reach a thickness of up to 100 m in places.

Alluvial deposits occur mainly along the channel of the Riviersonderend and Breede River.

The area is located along the E-W trending limb of the Cape Fold Belt. The western and south-western parts of the area are quite complex structurally with extensive folding and faulting present.

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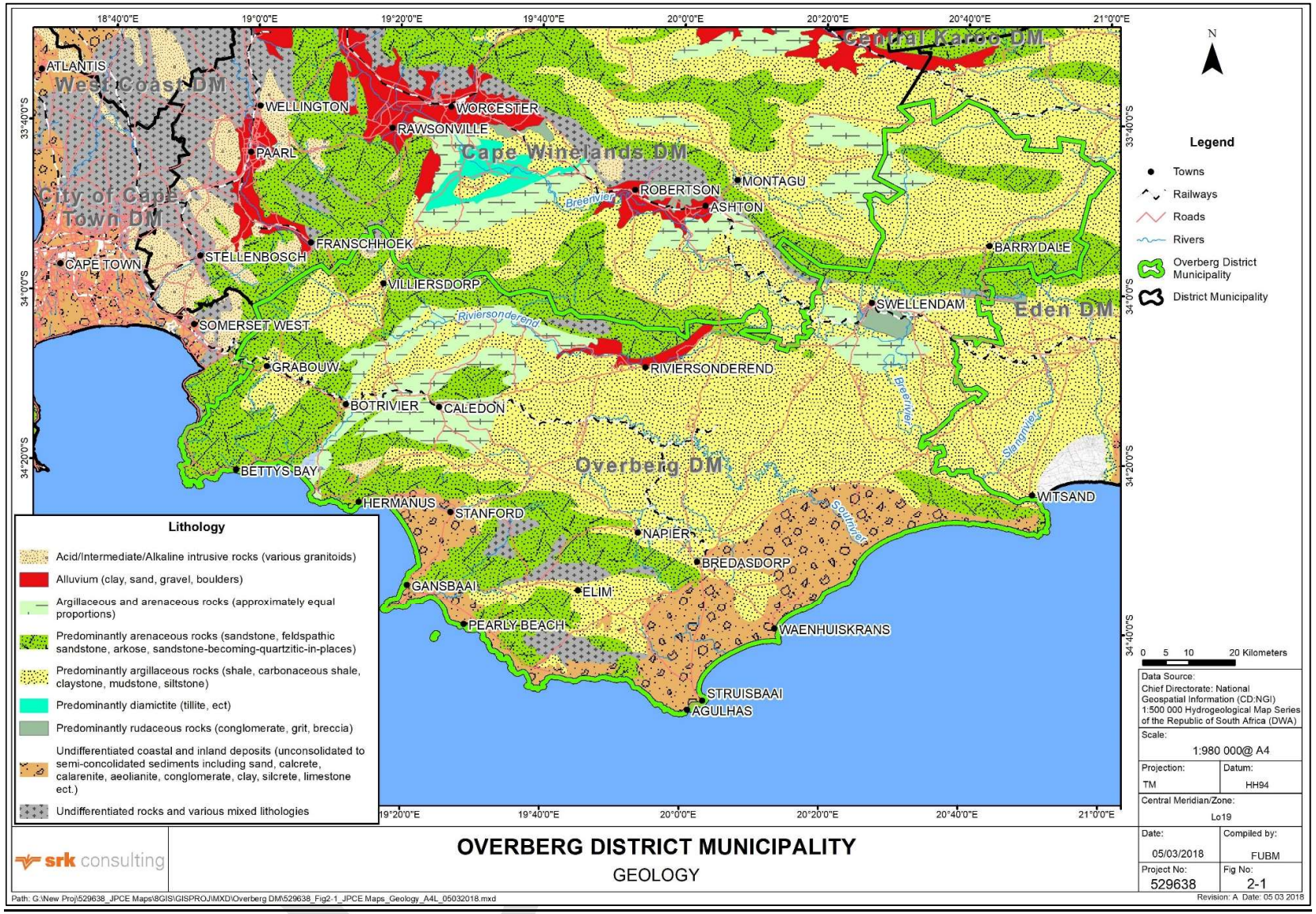

Figure 1-2: Geology of the Overberg District Municipal Area

1.6.2.2 Groundwater

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 rocks of the Malmesbury, Table Mountain, Bokkeveld or Witteberg Groups will be of the fractured or secondary type. These are shown as shades of green on **Figure 1-2**. Aquifers developed in the Bredasdorp Group and alluvium will be of the intergranular or primary type. These are shown as shades of violet on **Figure 1-3**. The granite and Enon rocks are of insignificant outcrop area.

The Malmesbury and Bokkeveld Groups generally have the lowest potential, being classified as B1 and B2, which implies a median borehole yield of <0.1 to 0.5 L/s.

The Table Mountain Group (TMG) is usually regarded as the major regional aquifer of the Western Cape. In the study area, these rocks are mainly classified as B3 to B4, i.e. a median borehole yield of 0.5 to 5.0 L/s. However, much of this aquifer is inaccessible for drilling and exploitation. There is a small strip classified as B5 near Bredasdorp.

The Bokkeveld Aquifer has a highly variable aquifer classification. In the Theewaterskloof area, it is classified as B5, i.e. median borehole yields of >5 L/s. However, over the bulk of its outcrop area east of Caledon, it is classified as B1, i.e. median borehole yields of <0.1 L/s. The Witteberg Group have an intermediate aquifer classification of B3.

The Bredasdorp Group forms a locally important aquifer in places such as Stanford and Struisbaai/Agulhas. Its importance is twofold, firstly as a direct source and secondly as an indirect source. Two production boreholes at Agulhas yield 15 L/s each from this aquifer for municipal supply. Groundwater levels in the TMG Aquifer at Struisbaai-Agulhas show minimal influence of pumping. This is attributed to recharge by leakage from the overlying Bredasdorp Group Aquifer.

Groundwater quality (**Figure 1-4**) is good in the TMG Aquifer and immediately surrounding formations, having an electrical conductivity (EC) of <70 mS/m. Groundwater quality deteriorates away from the TMG and to the east, the latter reflecting the lower rainfall and Bokkeveld bedrock in this area. There is a patch of highly saline groundwater with EC of >1000 mS/m in the central part of the area.

There are several springs in the area, both hot and cold. The Caledon Spring flows at a temperature of 38°C, indicating deep groundwater circulation related to faulting and the TMG. Cold springs occur along the coast associated with the basal conglomerate of the Bredasdorp Group, particularly at Stanford and Gansbaai.

Groundwater is used for municipal supply at Greyton, Genadendal, Bereaville, Villiersdorp, Botrivier, Caledon, Hermanus, Napier, Stanford, Bredasdorp and Struisbaai-Agulhas. This is all derived from the TMG and Bredasdorp Group. Target areas have been identified for exploration drilling in the TMG Aquifer in the Grabouw area for possible augmentation of Cape Town's water supplies.

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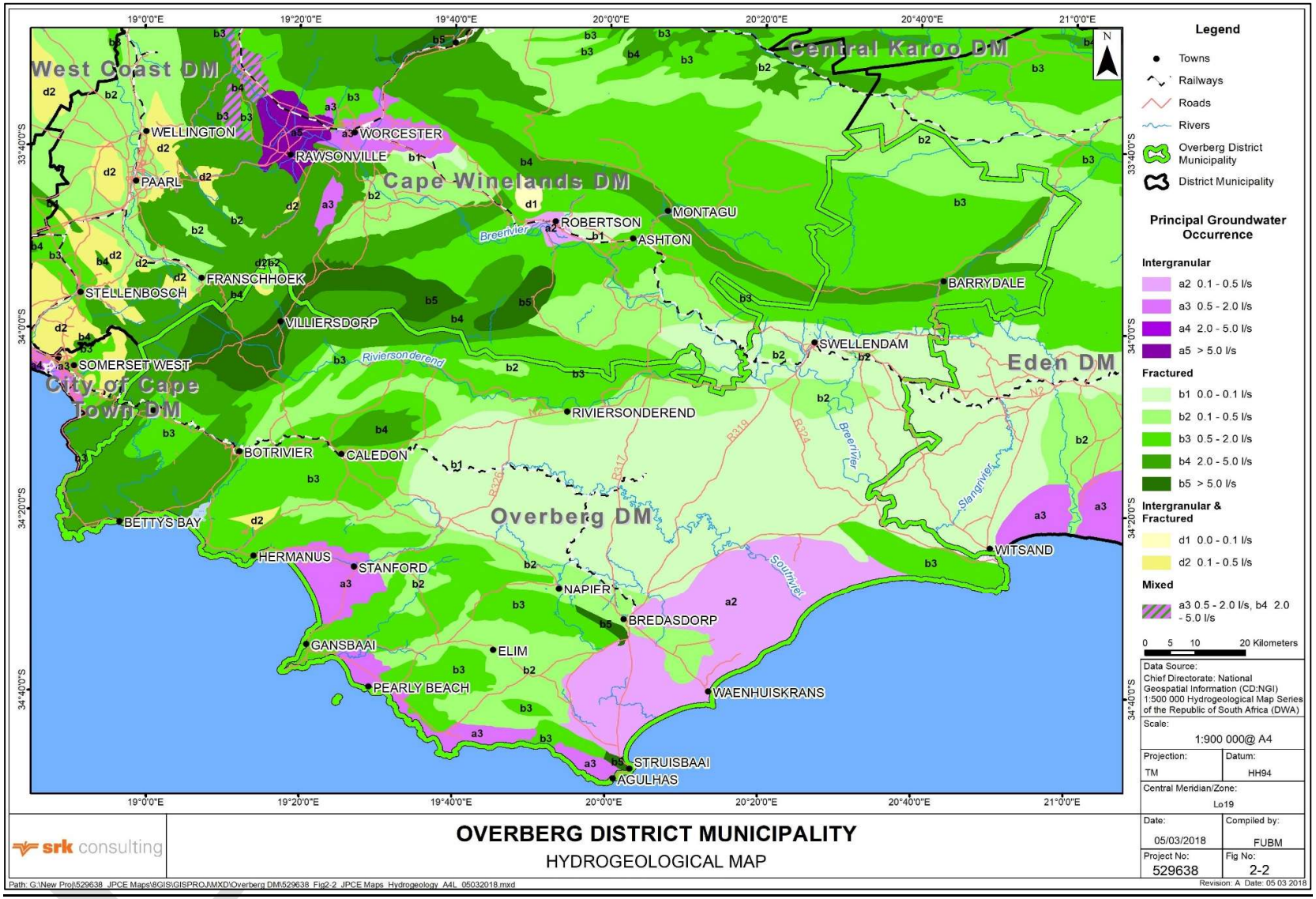

Figure 1-3: Hydrogeology of the Overberg District Municipal Area

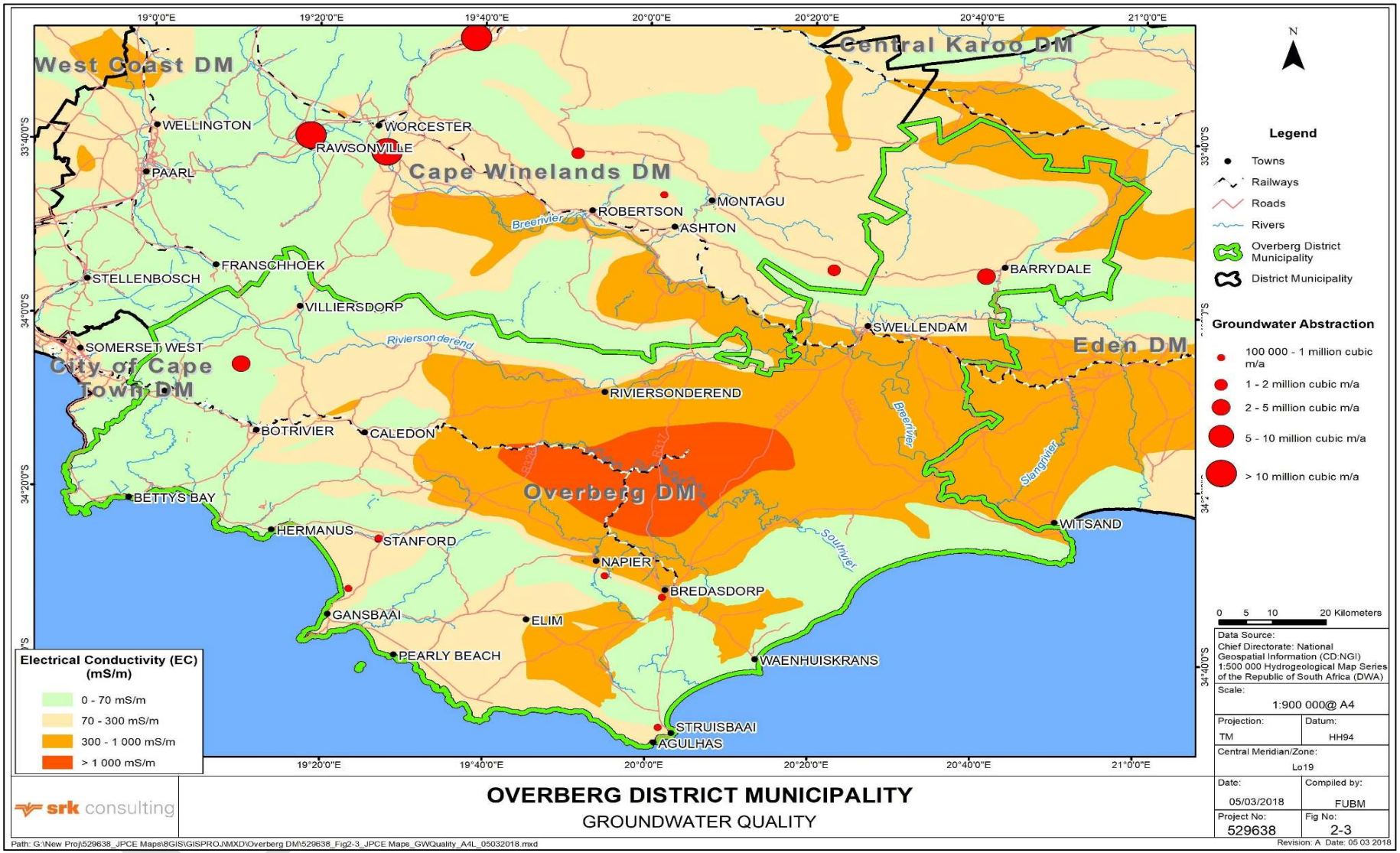

Figure 1-4: Groundwater Quality Map

1.7 DISTRICT MUNICIPALITY ROLE

The Local Government: Municipal Structures Act (Act 117 of 1998) 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. As far as District Municipalities go, section 84(1) of the act states that:

"*A district municipality has the following functions and powers:*

(a) Integrated development planning for the district municipality as a whole, including a framework for integrated development plans of all municipalities in the area of the district municipality.
(b) Potable water supply systems.
(c) Bulk supply of electricity, which includes for the purposes of such supply, the transmission, distribution and, where applicable, the generation of electricity.
(d) Domestic waste-water and sewage disposal systems.
(e) Solid waste disposal sites, in so far as it relates to-
  (i) the determination of a waste disposal strategy;
  (ii) the regulation of waste disposal;
  (iii) the establishment, operation and control of waste disposal sites, bulk waste transfer facilities and waste disposal facilities for more than one local municipality in the district.
(f) Municipal roads which form an integral part of a road transport system for the area of the district municipality as a whole.
(g) Regulation of passenger transport services.
(h) Municipal airports serving the area of the district municipality as a whole.
(i) Municipal health services.
(j) Firefighting services serving the area of the district municipality as a whole, which includes-
  (i) Planning, co-ordination and regulation of fire services;
  (ii) Specialised firefighting services such as mountain, veld and chemical fire services;
  (iii) Co-ordination of the standardisation of infrastructure, vehicles, equipment and procedures;
  (iv) Training of fire officers.
(k) The establishment, conduct and control of fresh produce markets and abattoirs serving the area of a major proportion of the municipalities in the district.
(l) The establishment, conduct and control of cemeteries and crematoria serving the area of a major proportion of municipalities in the district.
(m) Promotion of local tourism for the area of the district municipality.
(n) Municipal public works relating to any of the above functions or any other functions assigned to the district municipality.
(o) The receipt, allocation and, if applicable, the distribution of grants made to the district municipality.
(p) The imposition and collection of taxes, levies and duties as related to the above functions or as may be assigned to the district municipality in terms of national legislation. "

The ODM waste management function resides within the environmental management section of the ODM. In terms of waste management the ODM's website states that the Environmental Management section will strive to develop an IWMP in accordance with the legal requirements, as well as convene a regional waste forum. The Regional Waste Forum, that includes representation from all the Local Municipalities as well as Provincial Government on a quarterly basis has the following purpose:

- To promote cooperation between Municipalities in order to improve Waste Management within the region;
- To share best practises and transferral of knowledge and information;
- To create a platform for which information can be gathered to feedback to the Provincial Waste Forum.

The role of the District Municipality does thus not affect the solid waste functions of the Local Municipalities. Only when waste crosses a municipal border such as for the use of a regional disposal site, does it become a District function. The ODM owns and operates a district landfill site in the Karwyderskraal Landfill facility near Hawston in the Overstrand Local Municipality. This facility currently serves the Local Municipalities of Theewaterskloof and Overstrand with the disposal of household general waste, as well as the composting of green waste. A study is currently underway to establish the feasibility of expanding the functions of the Karwyderskraal Landfill to include waste from the other local municipalities in the District (Swellendam and Cape Agulhas).

2. STAKEHOLDER PARTICIPATION

2.1 CONSULTATION WITH AUTHORITIES

The Western Cape Department of Environmental Affairs and Development Planning (DEADP) is the provincial authority when it comes to waste management matters. They have published an Integrated Waste Management Planning Checklist that is aimed at assisting the municipalities in its jurisdiction with the development of their IWMPs. The ODM's IWMP will follow the guidelines given in this document.

Representatives of the DEADP were consulted prior to the development of the ODM IWMP and the draft IWMP report will be submitted to them before it is finalised and provided to the ODM as a final draft for approval.

2.2 CONSULTATION WITH THE LOCAL MUNICIPALITIES

The main stakeholders in the participation process of the ODM IWMP development is the local municipalities that form the district. They are served by the ODM and need to be satisfied with the level of service they receive, they were thus given opportunity to provide inputs into the development of the IWMP document. Meetings were held with each of the waste managers and the discussions and responses are documented in **Table 2-1**.

It is recommended that the draft IWMP document be included in the public consultation process of the IDP review since buy in from residents and key stakeholders would be required to ensure waste management strategies are sustainable.

The outcomes of the ODM IWMP will also be discussed at the regional waste forum for inputs from the local municipalities. The regional waste forum is chaired by the ODM and attended by all of the local municipalities within the district, and by a representative from provincial government.

After including the outcomes of the waste forum the IWMP document will be made available on the website of the ODM for information to those who want to access it.

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Table 2-1: Responses from Local Municipality Meetings

Municipality	Theewaterskloof	Overstrand	Swellendam	Cape Agulhas
Meeting Date	07 February 2018	06 February 2018	04 April 2018	05 February 2018
Attendance List	Hegans Marthinus (TWK), William Meyers (JPCE)	Johan van Taak (OS), William Meyers (JPCE)	Bartho Burger (SM), Reon Pienaar (JPCE)	Walter Linnert (CAM), William Meyers (JPCE), Reon Pienaar (JPCE)
Discussion Topic	Given the District Municipality functions described in the Municipal Structures Act (Act 117 of 1998, Section 84(1)), what is your expectations of the ODM?			
Municipality Response		The OM expects of the ODM to manage the district municipal landfill and to ensure that the local municipalities can use the site uninterrupted at an affordable charge. It further expects the ODM to maintain the District Forum to discuss waste management matters in the district.	The SM has challenges with the legal operation of the Bontebok landfill site outside Swellendam. They feel that they do not have enough budget and resources available to them to operate the landfill to the standard that the waste license requires. They would thus prefer if the operation of the landfill site can be taken over by the District Municipality.	The CAM has challenges with the legal operation of the Bredasdorp landfill. They feel that they do not have enough budget and resources available to them to operate the landfill to the standard that the waste license requires. They would thus prefer if the operation of the landfill site can be taken over by the District Municipality.
Discussion Topic	The goals of the ODM IWMP will be aligned to the main goals of the Western Cape Provincial IWMP. Have you informed the ward committees of the ODM IWMP development? If yes, what has the feedback been? If no, will you inform the ward committees of this and request inputs?			
Municipality Response		The ODM IWMP will be discussed at the ward committee meetings once it has been released for public comment.	The ODM IWMP has not been discussed at the ward committee meetings. Waste related matters at ward committee level is focused on local issues. Mr. Burger confirmed that it will be mentioned in upcoming meetings.	
Discussion Topic	Do you know or are you aware of any Private Parties or organizations that would want to provide inputs into the ODM IWMP? If yes, who are they and what are the contact details?			
Municipality Response	Earth Buddies.	Overstrand (now whale coast) Conservation Trust with contact person Rob Fryer	Agri World in Swellendam is appointed under contract by the SM to operate the Bontebok landfill. Mr. Paul v.d Merwe is the contact person and the contact details are Tel: 0825764956 e-mail: paul@agri-world.co.za and website: www.agri-world.co.za	
Discussion Topic	What current inter-municipal planning or projects do you currently have underway?			

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Municipality	Theewaterskloof	Overstrand	Swellendam	Cape Agulhas
Municipality Response	There is a current agreement with the Overstrand Municipality for use of Karwyderskraal cell 3 which will revert back to Overberg District once cell 4 is operational.	Nothing new. Inter municipal planning will get attention when the need arises. All the municipalities want a unified strategy but municipalities differ and a solution will need to be found to accommodate all the municipalities.	The Cape Agulhas Municipality commissioned a study to investigate the feasibility of developing a regional landfill site for shared use by the Swellendam and Cape Agulhas Municipalities. The outcome of this study is expected in late 2018.	The Cape Agulhas Municipality commissioned a study to investigate the feasibility of developing a regional landfill site for shared use by the Swellendam and Cape Agulhas Municipalities. The outcome of this study is expected in late 2018.
Discussion Topic	What current District municipal planning or projects do you currently have underway?			
Municipality Response	None	None	None	None
Discussion Topic	Kindly confirm the date of the latest approved IWMP of the municipality and provide any related comments you might have.			
Municipality Response	September 2014 3rd generation IWMP by JPCE is the latest.	May 2015 4th generation IWMP by JPCE is the latest.	July 2015 2nd generation IWMP by Mott McDonald Consultants is the latest.	November 2016 3rd generation IWMP by CHAND Consultants is the latest.
Discussion Topic	What is your current planning in terms of provision of waste management infrastructure in order to reach diversion targets?			
Municipality Response	1) Projects are undertaken in line with the IWMP. Grabouw Transfer Station has been extended.	1) The solid waste facilities are currently fenced but new fencing is required which will be addressed once the funds are available.	1) The Municipality wanted to introduce a clear bag system where source separated recyclables would be collected separately. It never materialized due to budget issues related to collection vehicles.	1) An area has been fenced at the Bredasdorp landfill and a new cell is planned.
	2) Caledon and Riviersonderend will be getting a RTS/MRF facility to be funded over multiple financial years up to 2020.	2) Gas monitoring points have been installed at the Gansbaai landfill	2) A private party (G&D Guesthouse) applied (on behalf of SM) to the Environmental Affairs National Resource Management fund for R30Million spread across three years to be used for construction of a new cell at the Bontebok landfill as well as additional waste diversion infrastructure. They received feedback from DEA that a decision would be reached by July 2018.	2) The Municipality has purchased a chipper for use by other departments and the Waste department uses it when the need arises.

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Municipality	Theewaterskloof	Overstrand	Swellendam	Cape Agulhas
	3) Botrivier site will be prioritized for rehabilitation and waste will be removed. Villiersdorp site received new boreholes with Greyton and Genadendal also inline for new boreholes. New drop offs were planned for Greyton and Genadendal but the project was moved out.	3) The Hermanus RTS will be getting an additional public drop off. Hawston and Fishershaven waste will be removed and taken to Karwyderskraal landfill.	3) Additional funds will be requested in the new budget for operation of the landfill site since the current allocation is not enough to include matters like security and access control into the contract. Currently Agri World receives waste on site and separate recyclables from the waste stream which is taken to their MRF in town for further processing.	3) A private contractor is currently processing builder's rubble on the landfill site which reduces disposal numbers.
	4) A new tender will be advertised for a contractor to service the Grabouw transfer station as well as chipping and transport to Grabouw composting plant. A recycling tender will be advertised for Villiersdorp.	4) Diversion targets are reached but will be improved on with chipping of garden waste at Gansbaai that will go to Karwyderskraal composting facility. Dumping of garden waste will also be prohibited in future.	4) The landfill site has a weigh pad which does not work. There are plans to rent/buy a chipper for the site in order to treat some of the garden waste on site.	
Discussion Topic	Are you currently considering the implementation of any Alternative Waste Treatment Technologies?			
Municipality Response	The municipality had discussions with the district and information can be obtained from them.	A private party has reached out to the Municipality about a possible gasification project but nothing has been decided yet. The Municipality is always on the lookout for new possibilities.	There has been discussions with a company who were interested in converting the sewerage sludge into electricity, nothing came of it and no other discussions were had.	The local abattoirs have approached the Municipality to use their garden waste in a composting facility. They have applied to the municipality and discussions are underway.
Discussion Topic	Please provide the latest waste diversion and disposal numbers of the Municipality			

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Municipality	Theewaterskloof	Overstrand	Swellendam	Cape Agulhas
Municipality Response	Karwyderskraal numbers are available. Other sites information received on 22 May 2018	Sent to JPCE	These numbers have been requested from Agri World	The Bredasdorp Landfill currently receives in the order of 1200 tons of waste per month. Around 100tons per month is currently diverted from the landfill through recycling and an additional 80 tons per month of builders rubble is used as cover material on the landfill.
Discussion Topic	Any additional inputs?			
Municipality Response		The Municipal by-laws will be amended during 2018	The Bontebok landfill was audited by the Provincial Department of Environmental Affairs in January 2018 and received a compliance rating of 65% indicating that the facility needs attention in some areas.	The Municipal by-laws will be amended during 2018

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3. STATUS QUO

This section of the IWMP entails the situational analysis of the Overberg District 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. It does not include municipal bylaws since this function lies with the local municipalities and the reader is referred to the IWMP documents of the four local municipalities for an overview of their waste by laws.

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 of the individual.

- **Section 32**

  Provides the right of 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.

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- **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 (Act 107 of 1998)

The NEMA 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 DEA 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 regulations were again amended in October 2017 through GN1094.) 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	R2000.00
Application for an environmental authorisation, for which a S&EIR is required in terms of the Environmental Impact Assessment Regulations	R10000.00
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, R5000 (Five Thousand Rand) if the S&EIR is triggered or R1000 (One Thousand Rand) if the basic assessment is triggered)
Amendment of an environmental authorisation on application by the holder of an environmental authorisation.	R2000.00

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 Environment Conservation Act, 1989 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 1: Minimum Requirements for health care risk waste containers
Annexure 2: Minimum Requirements for storage of health care risk waste in terms of regulation 3
Annexure 3: 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 and requires updating to reflect waste management goals beyond 2016.

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 must be reached by 2016. All listed targets must be reached by 2016:

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.

Draft

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 tonne 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 tonne 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 tonne 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 tonne 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 tonne 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 tonne 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 100m^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 80m^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 500m^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 500m^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 1000m2 and more. ”

Draft

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, 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 1 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 1 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 1 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 1 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 1 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 tons 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 1 *(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 1 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 1 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 1: 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;
(v) Garden waste;
(vi) Waste packaging;
(vii) Waste tyres;
(viii) Building and demolition waste not containing hazardous waste or hazardous chemicals; and
(ix) 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 2: 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 ton
(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

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Waste listed in section 2(a) of Annexure 1 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 1 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.	R10000.00
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.	R2000.00

3.1.21 National Environmental Management: Waste Act, 2008 (Act no. 59 of 2008): National Norms and standards for the Extraction Flaring 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): 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).

3.1.25 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.

3.1.26 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 to 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.

3.1.27 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.

3.1.28 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.

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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.

3.1.29 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, 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

OneCape2010 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 OneCape2040. 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

3.1.30 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.

3.1.30.1 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.

3.1.30.2 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.

3.1.30.3 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.

3.1.30.4 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.

3.1.31 Municipal By-Laws

The ODM has no general waste by-laws since this function lies with the local municipalities and the reader is referred to the IWMPs of the local municipalities for this information.

The ODM Municipal Health By-Law published in the Province of the Western Cape Provincial Gazette 7389 of 15 May 2015, does however provide information on hazardous and health care risk waste. The information and regulation of hazardous and health care risk waste is contained in Chapter 8 of this document in three parts. Part 1 pertains to general provisions, Part 2 discusses Hazardous Waste and Part 3 deals with Health Care Risk Waste.

This by-law requires all facilities that generate hazardous and/or medical waste to have a health certificate issued by the ODM health officer and further provides information and guidance on the storage and management requirements of hazardous and health care risk waste.

3.1.32 District Environmental Management Policy

The ODM Environmental Management Policy as reviewed on 08/12/2014 states the following regarding Waste Management:

"*In terms of waste management the environmental management section will strive to achieve the following:*

Waste reduction - Waste reduction targets will be aligned with available technology and capacity at the landfill facility. Our focus will be in the reduction in garden waste to landfill by means of composting and chipping activities.

Promoting good IGR structures within the waste management sector – The Overberg District Municipality will convene a Regional Waste Forum that will include representation from all the Local Municipalities as well as Provincial Government on a quarterly basis. The purpose of the forum will be:

- *To promote cooperation between Municipalities in order to improve Waste Management within the region;*
- *To share best practises and transferral of knowledge and information;*
- *To create a platform for which information can be gathered to feedback to the Provincial Waste Forum.*

Integrated Waste Management Plan – Section 11(4)(a) of the NEM: Waste Act states that:
Each municipality must – (i) Submit its integrated waste management plan to the MEC for approval; and (ii) include the approved integrated waste management plan in its integrated development plan contemplated in Chapter 5 of the Municipal Systems Act.

The environmental management section will ensure that the ODM comply in terms of the above mentioned legislation.

Karwyderskraal Landfill Site - The environmental management section will play an oversight role in the management of the site and adhere to the permit conditions (Permit 16/2/7/G501/D3/Z3/P374 dated 30 March 2000 and amended on 08 November 2000 and 09 April 2002)."

3.1.33 Discussion of legislation (effectiveness & implementation)

The above listed legislation (national, international and local) 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 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 rural municipalities 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. Local municipalities thus rely on the District to lead them in providing a sound policy which is easily adaptable and enforceable.

3.2 DEMOGRAPHIC PROFILE

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

3.2.1 Current and projected population and density

The ODM is the smallest district in the Western Cape Province, making up only 9% of its geographical area. The following local municipalities form part of the Overberg region: Theewaterskloof, Swellendam, Overstrand and Cape Agulhas. The seat of the municipality is in Bredasdorp. The statistics relating to population were taken from the 2011 Census data on the website of Stats SA. The 2011 population figures were, however, used as basis only and future projections were based on the information contained in the 2014 study by PWC. This study was done for the National Department of Social Development and aimed at providing updated population projections for the Western Cape Province from 2011 to 2040. DEADP comments on previous IWMP documents requested that the more realistic population projections contained in the PWC report be used in the compilation of IWMP documents in the Western Cape. PWC also used the 2011 population figures as basis.

The total population of each local municipality with its respective annual growth rate is shown in **Table** 3-1 below with a graphical breakdown given in **Figure 3-1**. The growth rates from the PWC study were applied to each total to estimate the current and future population of each municipality and the total population for the District. The census growth rates are shown for information and comparison purposes only.

Table 3-1: Current and Projected Population Figures

Municipality	Census Growth rate 2001 - 2011 (%)	PWC - WC Population Projection Growth Rate 2011 - 2040 (%)	2011 (Census)	Using PWC projections		
				2018	2025	2040
Cape Agulhas	1.95%	0.67%	33 038	34 619	36 276	40 097
Overstrand	3.42%	1.36%	80 358	88 327	97 087	118 894
Swellendam	2.57%	0.80%	35 916	37 976	40 155	45 253
Theewaterskloof	1.67%	0.92%	108 864	116 071	123 756	141 979
ODM	2.39%	1.02%	**258 176**	**276 994**	**297 273**	**346 223**

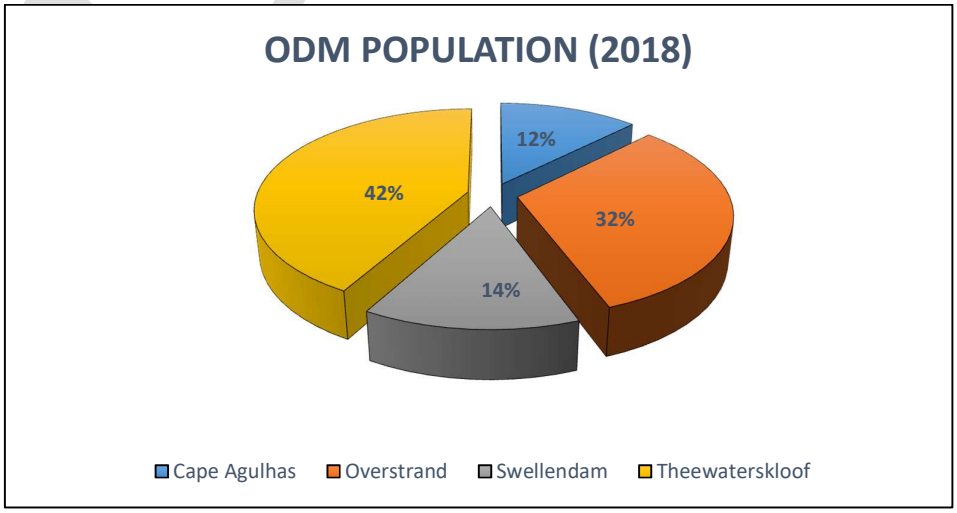

Figure 3-1: Graphical Display of Population Distribution

The population information above indicates that the Theewaterskloof Municipality has the highest percentage population with 42% of the people in the Overberg residing in the Theewaterskloof Municipality. The 2018 population projections indicate that the Overberg District Municipality currently has a total population of 276 994 people with an average 1.02% annual population growth rate (2011 – 2040). The municipality is the smallest district in the province, making up only 9% of its geographical area and about 4.5% of its total population.

The breakdown in **Table 3-2** shows how the population of the local municipalities within the ODM is distributed between ethnic groups and shows that the majority of people (53.9%) in the ODM is of coloured ethnicity with black Africans (25.8%) making up the second largest group. The census data further indicates that more than two thirds of the ODM (67.9%) is Afrikaans speaking with isiXhosa (17.5%) and English (6.7%) making up the next highest language groups.

Table 3-2: Ethnic breakdown of ODM Population

Ethnic Group	Overstrand	Theewaterskloof	Cape Agulhas	Swellendam	ODM
Black African	36.2%	26.4%	11.5%	12.4%	**25.8%**
Colored	31.0%	62.9%	65.6%	68.8%	**53.9%**
Indian/Asian	0.3%	0.4%	0.3%	0.3%	**0.3%**
White	31.2%	9.4%	21.6%	17.4%	**19.0%**
Other	1.2%	0.9%	0.9%	1.1%	**1.0%**

3.2.2 Socio-economic profile and education

Table 3-3 shows the 2011 socio-economic profile of the ODM according to annual household income obtained from Census 2011 with a graphical representation given in

Figure 3-2. 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.

Table 3-3: Population Profile according to Household Income

Municipality	No of Households (2011)	Population (2011)	Average Persons per Household	No of Households (2018)	Very Low and Low Income (%)	Middle Income (%)	High and Very High Income (%)
Cape Agulhas	10 162	33 038	3.25	10 648	48.9	19.9	31.4
Overstrand	28 010	80 358	2.87	30 788	52.8	15.6	31.6
Swellendam	10 139	35 916	3.54	10 721	51.9	20.5	27.5
Theewaterskloof	28 884	108 864	3.77	30 796	57.6	19.1	23.3
ODM	**77 195**	**258 176**	**3.34**	**82 953**	**54.2%**	**18.3%**	**27.5%**

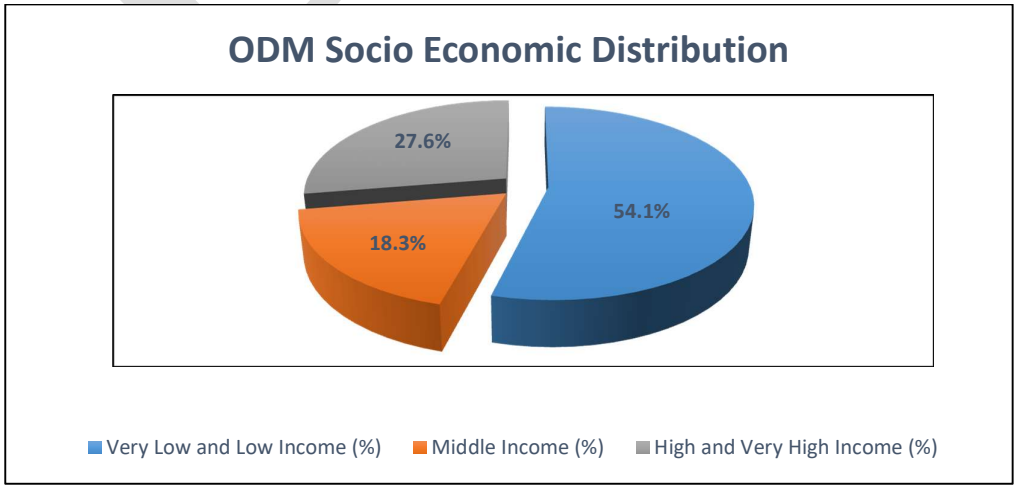

Figure 3-2: Graphical Display of Socio-Economic Distribution

According to Census 2011 (ODM total adapted accruing to PWC projections) the level of education in the ODM is as per the information in **Table 3-4**.

Table 3-4: Education Levels

	Cape Agulhas	Overstrand	Theewaterskloof	Swellendam	ODM
No Schooling	3.6%	3.2%	4.2%	3.0%	**3.6%**
Some Primary	43.0%	42.6%	41.9%	45.7%	**42.8%**
Completed Primary	7.7%	6.8%	7.2%	7.6%	**7.2%**
Some Secondary	33.4%	32.9%	32.6%	31.0%	**32.6%**
Completed Secondary	9.5%	11.8%	10.7%	9.0%	**10.7%**
Higher Education	1.4%	1.5%	1.4%	1.2%	**1.4%**
Not Applicable	1.6%	1.2%	2.0%	2.6%	**1.8%**

From the above, it is further stated that education levels according to age of those aged above 20 years, 3.2% have no schooling, 27.7% have matric and 9.7% have higher education.

3.2.3 Gender and age distribution

The population distribution according to gender and age is shown in **Table 3-5** below. The distribution is almost equal between males and females, with males slightly more in percentage than females in 2011 but gradually increases to a slight female dominance in 2040.

Table 3-5: Gender and Age Distribution

Age	Male 2011	Female 2011	Male 2020	Female 2020	Male 2040	Female 2040
0-14	31 291	30 852	33 690	33 125	35 038	34 138
15-64	88 451	86 076	94 880	93 156	115 639	115 015
65+	9 630	11 902	11 899	15 884	19 285	27 109
Total	129 372	128 830	140 469	142 165	169 961	176 262
Ratio	50.1%	49.9%	49.7%	50.3%	49.09%	50.91%

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 Overberg District Municipal SDF. The SDF information was based on the 2010 growth potential study. The information is given per town in **Table 3-6** and gives an indication of the growth potential for each town and municipality within the ODM.

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Table 3-6: Growth Potential Study Results

Town/Area	Local Municipality	From ODM SDF (2014)		From 2014 Growth Potential of Towns Report						
		Development Potential	Social Need	Growth Potential	Socio Economic Needs	Human Capital	Economic	Physical	Infrastructure	Institutional
Arniston	Cape Agulhas	Medium	High	Medium	Very Low	Medium	Medium	Medium	High	Low
Barrydale	Swellendam	Low	Medium	Medium	Low	Medium	Low	High	Medium	Medium
Bettys Bay	Overstrand	Medium	Low	High	Very Low	High	High	Medium	Very High	High
Botrivier	Theewaterskloof	Medium	Medium	High	Low	Medium	Medium	Very High	Medium	Medium
Bredasdorp	Cape Agulhas	Medium	Low	Medium	Medium	Medium	Medium	Medium	High	Low
Caledon	Theewaterskloof	Medium	Low	High	Medium	Medium	Medium	Very High	Medium	Medium
Elim	Swellendam	Low	Medium	Medium	Very Low	Medium	Low	High	Medium	Medium
Frans Kraal	Overstrand	High	Low	High	Medium	High	High	Medium	Very High	High
Gansbaai	Overstrand	Medium	Medium	High	Medium	High	High	Medium	Very High	High
Genadendal	Theewaterskloof	Low	High	High	Low	Medium	Medium	Very High	Medium	Medium
Grabouw	Theewaterskloof	High	Very High	High	High	Medium	Medium	Very High	Medium	Medium
Greyton	Theewaterskloof	Low	Medium	High	Very Low	Medium	Medium	Very High	Medium	Medium
Hawston	Overstrand	High	Medium	High	High	High	High	Medium	Very High	High
Hermanus	Overstrand	High	Low	High	High	High	High	Medium	Very High	High
Kleinmond	Overstrand	High	Medium	High	Low	High	High	Medium	Very High	High
Napier	Cape Agulhas	Low	Medium	Medium	Very Low	Medium	Medium	Medium	High	Medium
Onrus	Overstrand	Medium	Very Low	High	High	High	High	Medium	Very High	High
Pearly Beach	Overstrand	Low	Medium	High	Very Low	High	High	Medium	Very High	High
Pringle Bay	Overstrand	Medium	Very Low	High	Very Low	High	High	Medium	Very High	High
Riviersonderend	Theewaterskloof	Low	High	High	Low	Medium	Medium	Very High	Medium	Medium
Stanford	Overstrand	Medium	Low	High	Low	High	High	Medium	Very High	High
Struisbaai	Cape Agulhas	Medium	Medium	Medium	Very Low	Medium	Medium	Medium	High	Low
Suurbraak	Swellendam	Low	Very High	Medium	Very Low	Medium	Low	High	Medium	Medium
Swellendam	Swellendam	High	Medium	Medium	Medium	Medium	Low	High	Medium	Medium
Villiersdorp	Theewaterskloof	Medium	High	High	Medium	Medium	Medium	Very High	Medium	Medium

These condensed results of the DEADP study and ODM SDF indicate that the ODM has a generally high growth potential across all sub-areas, with the Overstrand Municipality seemingly the municipality with the overall highest 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 local municipalities within the ODM therefore has an overall high growth potential determined by the contributing factors. It is therefore important for the waste management departments to be up to date with new and potential developments in their Municipality to ensure that the solid waste management system will have the required capacity to keep up with the growth.

3.3 WASTE CLASSIFICATION, CHARACTERISATION AND QUANTITIES

The waste types and quantities generated and disposed in the ODM will be discussed in this section.

3.3.1 Waste types and classification

With reference to the Waste Act (Act 59 of 2008) the Waste Amendment Act (Act 14 of 2013) and their associated regulations, the only types of waste allowed for disposal at the Overberg disposal facilities are general wastes (Type 2, 3 and 4 wastes according to the classification regulations). No municipal landfills within the Overberg district are allowed to accept hazardous (or Type 0 and 1 wastes according to the classification regulations) for disposal.

The above legislation divides waste in South Africa into two main categories, being Hazardous and General. The current legislated definitions being:

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"*

Residue deposits and residue stockpiles refer to mining waste that does not form part of the municipal waste function. **Business waste** means "*waste that emanates from premises that are used wholly or mainly for commercial, retail, wholesale, entertainment or government administration purposes*".

General Waste – *"means waste that does not pose an immediate hazard or threat to health or to the environment, and includes –*

(a) Domestic waste;
(b) Building and demolition waste;
(c) Business waste;
(d) Inert waste; or
(e) Any waste classified as non-hazardous waste in terms of the regulations made under section 69,

and includes non-hazardous substances, materials or objects within business, domestic, inert, building and demolition wastes"

Domestic Waste – "means waste, excluding hazardous waste that emanates from premises that are used wholly or mainly for residential, educational, health care, sport or recreation purposes and includes:
(a) Garden and park wastes;
(b) Municipal waste;
(c) Food waste".

Building and Demolition Waste – " *means waste, excluding hazardous waste, produced during the construction, alteration, repair or demolition of any structure, and includes rubble, earth, rock and wood displaced during that construction, alteration, repair or demolition*".

Inert Waste – "*means waste that (a) does not undergo any significant physical, chemical or biological transformation after disposal; (b) does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and (c) does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant, and which include:*
(a) Discarded concrete, bricks, tiles and ceramics;
(b) Discarded glass
(c) *Discarded soil, stones and dredging spoil*".

3.3.2 Methodology

Accurate quantities for disposed general waste were obtained from the ODM Karwyderskraal landfill weighbridge and the Overstrand Gansbaai landfill weighbridge readings, as these are the only landfill facilities in the Overberg with operating weighbridges. The Karwyderskraal landfill receives waste from the western parts of the Overstrand and Theewaterskloof Municipalities and the Gansbaai landfill receives waste from the rest of the Overstrand municipality. Waste disposal figures for the other landfills were extrapolated from waste calculator data, recent past projects and information from the municipality and local IWMPs.

Waste generation rates were extrapolated from population figures and the waste categories were obtained from other similar studies undertaken.

3.3.3 General Waste Characterisation

Waste characterisation is best done through undertaking regular and thorough waste characterisation studies (WCS). The DEADP published a guideline for waste characterisation studies in February 2016 where it provides municipalities with tips and guidelines on how to undertake these studies. This guideline document states that proper waste characterisation studies "*provide decision-makers with real data of current and expected (future) solid waste generation trends among different demographic and socio-economic categories. It also provides valuable information for the planning of waste management infrastructure'*. The local municipalities need to use the information in their own IWMPs and it is thus recommended that the WCS be undertaken at a local municipality level. Information from the IWMPs of the four local municipalities that make up the ODM is thus given in the headings below. The WCS information is focussed on municipal waste only and is generally broken down into the categories shown in **Table 3-7**.

Table 3-7: Waste Characterisation Categories

Main Category	Sub-Category	Description
Organic	Household	All household organic waste such as kitchen (food) waste. Can also be seen as compostable.
	Garden	Waste from gardens such as grass cuttings, twigs, leaves and small branches. Mixed with this is some soil and stony material due to sweeping etc.
	Other	Organic material such as used diapers and pet litter.
Recyclable	Glass	All types of glass, mainly bottles.
	Metal	Ferrous and non-ferrous, mainly consisting of cans.
	Paper	All types of paper including card board, white paper, newsprint, glossy paper (magazines) and mixed paper.
	Plastic	Recyclable plastics including PET, Polypropylene, HDPE, LDPE, Polystyrene.
Non-recyclable	General	Waste such as fabrics and recyclables contaminated beyond being recoverable.
	Plastic	Non-recyclable plastics including PVC, non-categorised plastics e.g. chairs, coat hangers, toys and plastic cups as well as plastics from the recyclable group, but that have been contaminated beyond the point of recovery.
	Fluid	For health and safety reasons, bottles containing fluids were put under this category.

3.3.3.1 Overstrand Local Municipality

The 2015 Overstrand IWMP reported the following waste numbers as recorded for the 2013/14 financial year. All the disposed waste within the Overstrand Municipality is disposed at either the Karwyderskraal or Gansbaai Landfills and both these facilities have weighbridges that record the waste entering the facility.

Table 3-8: Overstrand IWMP Waste Numbers

Waste	Number	Comment
Total Waste (t)	**61,734.13**	
General Waste (t)	39,603.88	64% of Total
Garden Waste (t)	3,239.67	5% of Total
Building and demolition waste (t)	6,874.18	11% of Total
Chipped Greens (t)	7,432.96	12% of Total
Recycling Tailings (t)	1,745.90	3% of Total
Recycled (t)	2,837.55	5% of Total
Total Disposed (t)	47,688.60	77% of waste landfilled
Total Diverted (t)	14,045.54	23% of waste diverted from landfill

JPCE receives monthly data on waste quantities from the Overstrand Municipality and recent figures indicate that the diversion rate has increased to as much as 60% for some of the months on record.

The DEADP commissioned a study in 2007 to determine the characterisation of the disposed waste at various landfills in the Overberg District. From that study, the anticipated average waste composition of the Overstrand Municipality can be derived to include the following recyclable materials (by mass):

Paper and Card board: 20%
Plastics: 13%
Glass: 6%
Metal: 4%
Garden Waste: 17%
Other (B&D, inert, residue) 40%

Without the presence of a detailed waste characterisation study these numbers can be assumed accurate and reflects the portion of the recyclable waste in the general waste stream.

3.3.3.2 Cape Agulhas Local Municipality

The Cape Agulhas Municipality (CAM) utilizes the Bredasdorp Landfill just outside Bredasdorp as it's only operating landfill for the receipt of waste. The 2016 (3rd generation) IWMP for CAM, done by Chand Environmental Consultants, is unclear on the exact volume of waste currently being disposed of at the landfills. They report a disposal volume of 11,400 m^3 per annum at the Bredasdorp Landfill which translates to about 3,000 tons per annum. A study into the assessment of waste management infrastructure in the Western Cape, done by JPCE (Pty) Ltd in 2016, compared different sources of information and confirms that a disposal tonnage of closer to 14,400 tons per annum (1,200 t/month), as provided by the CAM for this study, is closer to a true reflection. This translates to about 55 tons of waste per day. The CAM does implement a system of separation at source where recyclables are collected separately. It is unclear what volumes of recyclables are collected and treated and how this impacted on recent landfilling volumes since the Bredasdorp landfill does not have a weighbridge for the recording of waste disposal data.

The 2016 CAM IWMP quotes the May 2013 State of Environment Outlook Report for the Western Cape Province, Waste Management Chapter (draft for public comment) for waste characterisation information. It states that this study provides an analysis of the waste stream from the Overberg District Municipality and that from this information it can be derived that the following percentages (by mass) of recoverable material could be present in Cape Agulhas' general waste stream:

Paper and Card board:	22%
Plastics:	10%
Glass:	5%
Metal:	6%
Garden Waste:	24%
Other (B&D, inert, residue)	33%

The waste characterisation data reported in the IWMP suggests that the recyclable portion of the municipal waste stream is between 52% and 54%, with the organic/garden waste portion between 32% and 35%. Garden waste does not get collected by the municipality from kerbside and generally gets taken to the landfills directly by the public. The exact tonnages of garden waste being landfilled is thus unknown and figures are based on estimates only.

3.3.3.3 Swellendam Local Municipality

The DEADP undertook a waste characterisation study in 2014 on business and residential waste collected by the SLM. The 2015 IWMP reported the following waste characterisation for the Municipality.

Table 3-9: Swellendam Waste Characterisation from IWMP

Waste Type	Percentage
Plastic (soft)	12%
Plastic bottles	9%
Paper	16%
Cardboard	9%
Metal	3%
Food/greens	32%
Nappies/sanitary/condoms	4%
Clothing	4%
Glass	11%
Other(batteries, globes etc)	1%
Total	**100%**

The IWMP further indicated that 54% of the municipal waste stream is thus made up of potential recyclable material.

3.3.3.4 Theewaterskloof Local Municipality

Waste from Villiersdorp, Grabouw and Botrivier gets disposed of at the ODM Karwyderskraal landfill and recorded accurately. This makes up about 717 tons of waste monthly (average for last three years from weighbridge records). Waste from the other towns within the municipality is disposed of at the Caledon and Riviersonderend landfills. The municipality has not recently completed a WCS. The Department of Environmental Affairs and Development Planning (DEA&DP) commissioned a study in 2007 to determine the characterisation of the disposed waste at various landfills in the Overberg District. From that study, the anticipated average waste composition of the Theewaterskloof Municipality can be derived to include the following recyclable materials (by mass):

Paper and Card board:	21%
Plastics:	14%
Glass:	5%
Metal:	3%
Garden Waste	12%
Other (B&D, Inert, Residue)	45%

3.3.3.5 ODM Waste Characterisation

The information in the headings above show that characterisation of general municipal waste is not an exact science. It differs from municipality to municipality and will be different for each town, business, season, year etc.

The above information will then be the assumed characterisation of general waste within the ODM prior to any recovery or recycling of waste taking place.

The DEADP developed a guideline document for municipalities to conduct their own waste characterisation studies in an effort to obtain normalised information on the waste within the province. Local municipalities should be requested to consult this document and undertake the studies with leadership on the process provided by the ODM.

The 2007 characterisation report is still the best available representation of the Cape Winelands waste stream (with the exception of Swellendam Municipality). To conduct a waste characterisation study that meets the above statistical requirements will require data collected over an entire year. Until such a study is commissioned and completed, the existing report is used for the purposes of this IWMP.

3.3.4 General Waste Generation

The estimates on general waste generated within the ODM will be based on published waste generation rates per capita using the population figures given previously. Actual and estimated waste disposal rates will then be discussed later in order to draw conclusions on the current waste diversion within the ODM.

The Department of Environmental Affairs, through the 2006 state of the Environment Report published the following waste generation rates per capita:

- Low Income = 0.41kg/person/day or (0.41kgx365 days) = 149.65kg/person /year
- Middle Income = 0.74kg/person/day or (0.74kgx365days) = 270.1kg/person/year
- High Income = 1.29kg/person/day or (1.29kgx365days) = 470.85kg/person/year

As per the 2011 census data the low income population was taken as having an annual income of less than R38,200, the middle Income group between R38,201 and R76,400 and the high income as having an annual income of more than R76,400.

The current and future (next three years) estimated waste quantities generated in the ODM is then as per the Tables on the following pages (**Table 3-10** to **Table 3-15**).

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Table 3-10: Current and Projected Waste Quantities for Overstrand Municipality

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)	Average Waste Generation Factor for Area in kg/p/d
Lebanon State forest	79	20	80	20	81	20	82	21	0.69
Highlands State Forest	82	23	84	23	85	24	86	24	0.77
Betty's Bay SP	1 517	544	1 537	552	1 558	559	1 580	567	0.98
Overstrand NU	5 579	1 543	5 655	1 564	5 732	1 585	5 810	1 607	0.76
Salmon dam Nature Reserve	0	0	0	0	0	0	0	0	0.00
Walker Bay State Forest	30	9	30	9	30	9	31	9	0.83
Rooi Els SP	138	56	140	56	142	57	144	58	1.10
Arabella Country Estate SP	73	29	74	29	75	29	76	30	1.08
Kleinmond SP	7 291	1 949	7 390	1 975	7 490	2 002	7 592	2 030	0.73
Pringle Bay SP	884	309	896	313	908	317	920	322	0.96
Fisherhaven SP	795	283	806	287	816	290	828	294	0.97
Hawston SP	9 029	2 284	9 151	2 315	9 276	2 347	9 402	2 379	0.69
Onrus River SP	3 472	1 271	3 520	1 288	3 567	1 306	3 616	1 323	1.00
Vermont	2 190	821	2 219	832	2 250	843	2 280	854	1.03
Fernkloof Estate	125	51	127	52	129	53	130	53	1.12
Voëlklip	1 270	528	1 287	535	1 304	542	1 322	549	1.14
Hermanus SP 2	26	7	27	7	27	7	27	7	0.71
Hermanus SP	4 742	1 792	4 806	1 817	4 872	1 842	4 938	1 867	1.04
Mount Pleasant	5 329	1 462	5 401	1 482	5 475	1 502	5 549	1 522	0.75
Hemel en Aarde	564	217	572	220	579	223	587	226	1.05
Sand Bay SP	3 947	1 338	4 001	1 357	4 055	1 375	4 110	1 394	0.93
Zwelihle SP	20 016	3 829	20 288	3 881	20 564	3 934	20 844	3 987	0.52
Stanford SP	5 273	1 152	5 344	1 168	5 417	1 184	5 491	1 200	0.60
Die Kelders	1 181	436	1 197	442	1 213	448	1 229	454	1.01
Gansbaai SP	11 571	2 530	11 728	2 565	11 888	2 600	12 050	2 635	0.60
Birkenhead SP	59	25	60	25	61	26	62	26	1.16
Van Dyks Bay SP	551	197	558	200	566	202	573	205	0.98
Uilenkraalsmond	112	30	114	30	115	30	117	31	0.72
Franskraalstrand SP	1 174	387	1 190	393	1 206	398	1 222	403	0.90

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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)	Average Waste Generation Factor for Area in kg/p/d
Baardscheerders Bosch SP	115	37	117	37	119	38	120	38	0.87
Pearly Beach SP	1 144	266	1 160	270	1 176	274	1 192	277	0.64
Viljoenshof	53	16	53	16	54	16	55	17	0.83
TOTAL	**88 410**	**23 440**	**89 612**	**23 759**	**90 831**	**24 082**	**92 066**	**24 410**	0.73

The tonnages in the above table are estimated based on published data regarding population figures and waste generation rates per capita. As mentioned the Overstrand Local Municipality has weighbridges at both the landfill facilities that serve this local municipality and data from these weighbridges are recorded very accurately. JPCE has access to this weighbridge data going back a number of years and the tonnages recorded at the Gansbaai and Karwyderskraal landfills (combined) for the year 2016/17 is given in **Table 3-11** below.

Table 3-11 : Overstrand Municipality Weighbridge Data

Month	Total Waste	General Waste	Garden Waste	Builders Rubble	Mix	Chipped Greens	Recycling Tailings	Recycled	Total Disposed	Total Diverted
Jul-16	5 654.54	1 939.02	-742.38	1 903.52	1 419.48	1 614.70	154.62	220.56	1 915.76	3 738.78
Aug-16	5 932.35	2 040.50	-607.22	1 851.37	1 261.12	1 573.54	163.80	247.38	2 260.06	3 672.29
Sep-16	6 604.68	2 307.56	98.30	2 092.27	1 142.64	600.94	131.08	231.89	3 679.58	2 925.10
Oct-16	7 725.67	2 350.79	28.77	3 297.53	918.54	710.99	167.32	251.73	3 465.42	4 260.25
Nov-16	10 124.62	2 503.19	110.74	4 742.56	1 734.56	714.87	109.50	209.20	4 457.99	5 666.63
Dec-16	9 625.93	2 963.36	22.44	4 478.15	1 285.44	496.08	125.98	254.48	4 397.22	5 228.71
Jan-17	7 695.45	3 489.37	78.81	1 696.77	1 645.96	345.58	131.14	307.82	5 345.28	2 350.17
Feb-17	7 493.10	3 037.39	-41.16	2 407.26	901.75	806.27	129.04	252.55	4 027.02	3 466.08
Mar-17	7 884.33	2 249.60	145.10	3 106.16	1 627.26	399.58	131.52	225.11	4 153.48	3 730.85
Apr-17	8 417.54	2 684.34	-110.40	3 512.53	1 399.50	616.64	79.80	235.13	4 053.24	4 364.30
May-17	7 083.25	2 371.64	87.20	2 656.42	1 006.50	639.02	74.06	248.41	3 539.40	3 543.85
Jun-17	11 346.92	2 231.98	26.60	4 231.58	3 639.22	932.32	41.44	243.78	5 939.24	5 407.68
Year Total	**95 588.38**	**30 168.74**	**- 903.20**	**35 976.12**	**17 981.97**	**9 450.53**	**1 439.30**	**2 928.05**	**47 233.69**	**48 354.70**
Ave Monthly	7 965.70	2 514.06	- 75.27	2 998.01	1 498.50	787.54	119.94	244.00	3 936.14	4 029.56
Ave Daily (6day)	306.37	96.69	- 2.89	115.31	57.63	30.29	4.61	9.38	151.39	154.98

There are a number of points to be made given the data in the above table. Firstly it is apparent that the estimated annual tonnage of waste generated in Overstrand using the population and waste generation rates as in **Table 3-10** is **23,440 tons** and this is significantly less than the **95,588.38 tons** (disposed plus diverted) in **Table 3-11**. Then it is clear that the Overstrand Municipality diverts in the order of 50% of the generated waste from landfill through recycling, composting and crushing (or using as cover) of builders rubble.

The estimated tonnages of waste generated in the Overstrand region is based on the population figures using the 2011 Census as a basis. This number represents only the permanent residents of the municipality and does not take into account the increase in population over weekends and holidays. It is reported that the increase of people in the Hermanus, Gansbaai and Kleinmond areas during weekends and holidays is in the order of three times the permanent population, and this happens throughout the year given the Municipality's close proximity to Cape Town and its popularity as a holiday destination. The historic data over the weighbridge also shows that this increase is actually constant throughout the year with only a minor spike during the summer holiday season. The data above is only for contributions from the Overstrand Municipality but since the Karwyderskraal landfill also provides for the Villiersdorp, Grabouw and Botrivier areas of the Theewaterskloof municipality, disposal data from these areas can also be analysed. Interestingly the tonnages from these areas that gets recorded at the weighbridge (8500 tons for the 2016/17 period) is very similar to the estimated tonnages using the population and waste generation rates (9200 tons for the 2018 year). This proves that the Overstrand increase is due to the contribution of non-permeant residents.

Table 3-12: Current and Projected Waste Quantities for Cape Agulhas Municipality

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)	Average Waste Generation Factor for Area in kg/p/d
Napier SP	4 093	990	4 120	996	4 148	1 003	4 176	1 010	0.66
Tamatekraal	321	111	323	112	325	113	327	113	0.95
De Hoop Nature Reserve	28	8	28	8	29	8	29	8	0.80
Cape Agulhas NU	6 416	1 648	6 459	1 659	6 502	1 670	6 546	1 681	0.70
De Mond State Forest	3	1	3	1	3	2	3	2	1.30
Bredasdorp Industrial	113	33	114	33	115	34	115	34	0.80
Kleinbegin	3 206	732	3 228	737	3 250	742	3 271	747	0.63
Bredasdorp SP	10 764	3 309	10 836	3 331	10 908	3 353	10 981	3 376	0.84
Selfbou	2 191	654	2 206	658	2 221	662	2 235	667	0.82
Elim SP	1 477	369	1 487	371	1 497	374	1 507	376	0.68
Arniston SP	1 327	319	1 335	321	1 344	323	1 353	325	0.66
Molshoop	2 446	481	2 462	484	2 479	488	2 495	491	0.54
Struisbaai SP	41	15	41	15	41	15	42	15	1.01
Argonauta	1 578	534	1 589	537	1 599	541	1 610	544	0.93
Agulhas SP	575	196	579	198	583	199	587	200	0.93
Suiderstrand SP	47	15	47	16	48	16	48	16	0.90
Total	**34 626**	**9 415**	**34 858**	**9 478**	**35 092**	**9 542**	**35 327**	**9 605**	**0.87**

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Table 3-13: Current and Projected Waste Quantities for Swellendam Municipality

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)	Average Waste Generation Factor for Area in kg/p/d
Barrydale SP	4 393	1185.88	4 428	1195.37	4 464	1204.93	4 500	1214.57	0.74
Marloth Nature Reserve	16	5.92	16	5.96	16	6.01	16	6.06	1.02
Swellendam NU	10 975	2855.32	11 063	2878.16	11 152	2901.19	11 241	2924.39	0.71
Suurbraak SP	2 316	540.47	2 334	544.80	2 353	549.16	2 372	553.55	0.64
Rietkuil SH	63	9.57	64	9.64	64	9.72	65	9.80	0.41
Buffeljagsrivier SP	1 523	359.57	1 535	362.45	1 547	365.35	1 559	368.27	0.65
Hermitage	311	81.09	313	81.74	316	82.39	318	83.05	0.71
Swellendam SP	4 945	1766.29	4 985	1780.42	5 025	1794.67	5 065	1809.02	0.98
Railton	13 272	3021.72	13 378	3045.89	13 485	3070.26	13 593	3094.82	0.62
Bontebok National Park	19	0.05	19	0.05	19	0.05	19	0.05	0.01
Malgas SP	48	15.63	48	15.76	48	15.89	49	16.01	0.90
Kontiki	13	3.46	13	3.49	13	3.52	13	3.54	0.75
Infanta SP	82	26.18	83	26.39	84	26.60	84	26.82	0.87
Total	**37 976**	**9871.15**	**38 280**	**9 950.12**	**38 586**	**10 029.73**	**38 895**	**10 109.96**	**0.71**

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Table 3-14: Current and Projected Waste Quantities for Theewaterskloof Municipality

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)	Average Waste Generation Factor for Area in kg/p/d
Goniwe Park	4 731	812	4 774	820	4 818	827	4 863	835	0.47
Villiersdorp SP	2 415	811	2 437	818	2 460	826	2 482	833	0.92
Nuwedorp B	3 522	859	3 554	867	3 587	875	3 620	883	0.67
Theewaterskloof NU	36 467	9 530	36 803	9 617	37 141	9 706	37 483	9 795	0.72
Genadendal SP1	4 420	976	4 461	985	4 502	994	4 544	1 003	0.60
Bereaville	748	145	755	146	762	148	769	149	0.53
Genadendal SP2	867	179	875	180	883	182	891	184	0.56
Dennehof SP	128	48	129	48	130	49	132	49	1.03
Bosmanskloof	969	205	978	207	987	209	996	210	0.58
Heuwelkroon	1 215	255	1 227	257	1 238	260	1 249	262	0.57
Greyton SP	780	302	788	305	795	308	802	311	1.06
Riviersonderend SP	5 594	1 284	5 646	1 296	5 698	1 308	5 750	1 320	0.63
Elgin SP	1 017	258	1 027	260	1 036	263	1 045	265	0.69
Swannie River	246	109	249	110	251	111	253	112	1.21
Nuwedorp A	921	362	930	365	938	369	947	372	1.08
Grabouw Industrial Park	13	0	13	0	13	0	13	0	0.01
Rooidakkies	3 509	633	3 541	639	3 574	645	3 607	651	0.49
Pineview North	4 318	1 385	4 358	1 398	4 398	1 411	4 438	1 424	0.88
Pineview	14 435	3 029	14 568	3 057	14 702	3 085	14 837	3 113	0.57
Grabouw SP	1 628	606	1 643	611	1 658	617	1 673	623	1.02
Dennekruin	1 542	356	1 556	359	1 570	363	1 585	366	0.63
Snake Park	5 726	1 093	5 778	1 104	5 831	1 114	5 885	1 124	0.52
Middleton SP	1 027	306	1 036	309	1 046	312	1 055	315	0.82
Caledon SP	4 133	1 520	4 171	1 534	4 209	1 548	4 248	1 562	1.01
Uitsig	3 723	909	3 757	917	3 792	926	3 827	934	0.67
Tjotjombeni	742	156	749	157	756	159	763	160	0.57
Bergsig	5 291	1 563	5 339	1 578	5 388	1 592	5 438	1 607	0.81
Botvilla	1 318	286	1 330	289	1 342	291	1 355	294	0.59
Botrivier Dorpsgebied	678	191	684	193	691	195	697	196	0.77
Botrivier SP	3 870	905	3 906	913	3 942	922	3 978	930	0.64
TOTAL	**115 995**	**29 072**	**117 062**	**29 340**	**118 139**	**29 609**	**119 226**	**29 882**	**0.69**

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Table 3-15: Current and Projected Waste Quantities for Overberg District Municipality

Municipality	Population (2018)	Waste Generated in t/a (2018)	Population (2019)	Waste Generated in t/a (2019)	Population (2020)	Waste Generated in t/a (2020)	Population (2021)	Waste Generated in t/a (2021)	Average Waste Generation Factor for Area in kg/p/d
Overstrand	88 410	23 440.40	89 612	23 759.19	90 831	24 082.31	92 066	24 409.83	0.73
Cape Agulhas	34 626	9 414.98	34 858	9 478.06	35 092	9 528.25	35 272	9 605.49	0.87
Swellendam	37 976	9 871.15	38 280	9 950.12	38 586	10 029.73	38 895	10 109.96	0.71
Theewaterskloof	115 995	29 072.07	117 062	29 339.54	118 139	29 609.46	119 226	29 881.87	0.69
TOTAL	**277 007**	**71 798.60**	**279 812**	**72 526.91**	**282 648**	**73 249.75**	**285 458**	**74 007.15**	**0.75**

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3.3.4.1 Recoverable Materials in Waste Stream

So, with the general waste breakdown established earlier, the ODM general waste composition for 2018 is shown in **Table 3-16** with a visual representation in

Figure 3-3.

Table 3-16: ODM General Waste Composition (2018)

Municipality	PAPER/ CARD (t/a)	PLASTICS (t/a)	GLASS (t/a)	METAL (t/a)	ORGANICS (t/a)	OTHER (t/a)	TOTAL (t/a)
Overstrand	4 688	3 047	1 406	938	3 985	9 376	23 440
Cape Agulhas	2 071	941	471	565	2 260	3 107	9 415
Swellendam	2 468	2 073	987	296	3 159	888	9 871
Theewaterskloof	6 105	4 070	1 454	872	3 489	13 082	29 072
TOTAL	**15 332**	**10 132**	**4 318**	**2 671**	**12 892**	**26 454**	**71 799**
(as percentage)	21%	14%	6%	4%	18%	37%	100%

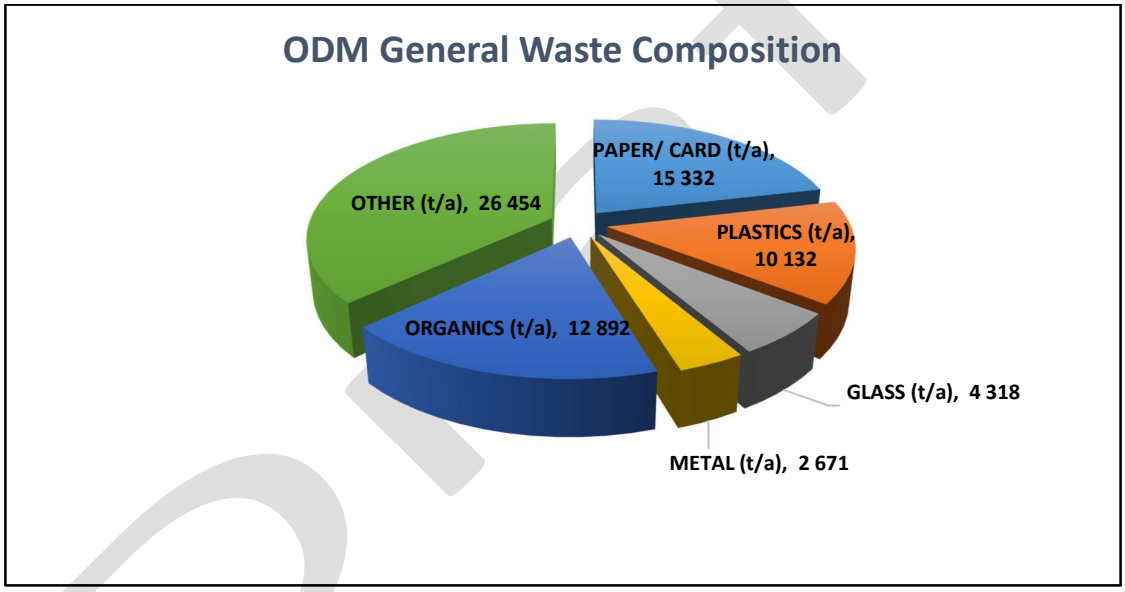

Figure 3-3: ODM General Waste Composition (2018)

The above figures give a total of approximately 32,453 tonnes of mainline recyclable materials per annum within the ODM, which is 45% of the generated waste stream. It should be noted that this reflects the recyclable portion of the waste stream only as the mathematical representation. The full 45% cannot be seen as recoverable in the practical sense at this stage.

Due to the methods of collection, i.e. the collection of mixed un-separated household waste (in most cases), a large amount of deterioration and contamination of potentially recoverable material takes place. Post-collection recovery (as is currently the norm in South Africa) implies that only a part of the above tonnages are available for recovery and recycling, due to contamination. For that reason separation at source is considered to be the preferred methodology to increase the volumes and value of recovered materials. Even with source separation some contamination still takes place, but less than mixed bag waste. The Municipalities in the Overberg District implement source separation (mostly) and are expanding on this service.

Although experience has shown that participation by the public is largely economy driven, the current trend is that separation at source, which implies that recoverable materials are separated by the home owner and “given” to the municipality (or Service Provider) for free, is mainly supported by the middle and higher income groups, whereas the low and very low income groups support buy-back centres or swop-shops where recoverable materials are bought/traded from the residents.

However, recently acquired data (measured quantities in Drakenstein Municipality over 5 years, Overstrand Municipality over 3 years and Swartland Municipality over 10 years) illustrates that the implementation of source separation only leads to a 1% increase in over-all recovered material volume. This small increase may be attributed to the fact that source separation was only implemented in a certain group of neighbourhoods and not throughout the whole of the area where the data was received. If one looks at the statistics per neighbourhood, the increase in material recovery is reportedly 15%. With these relatively small gains in recovery, the Municipality should evaluate the economic feasibility of implementing a source separation system. It is still the preferred collection method, but expensive to implement and would probably receive lower priority as opposed to alternative strategies and action plans that need to be executed by the Municipality in the upcoming years.

Recent statistics obtained from the Drakenstein Municipality show that participation rates are as following: The Middle income group participation rates vary between 12-25% and the High income group participation vary between 35-40%. The low and very low income groups participate at an average of 11-15%. This leads to a reduced volume of material expected from MRF recovery in the municipality and can only increase with increased source separation and collection and increased public participation Rates.

3.3.4.2 Paper and Cardboard

Paper and Cardboard form the foundation for any recovery venture, due to the relative stable demand and numerous recycled products made from recovered paper.

Waste paper is transformed from one type to another during the recycling process. The supply and demand for waste paper, although stable, is cyclical in nature, and therefore marketing patterns have to be adapted accordingly.

Some of the factors that contribute to this cyclical demand for recovered paper are:

- difficulty for mills to carry large stock
- periodic mill shut-downs result in fluctuations in demand
- paper stock is considered perishable and thus hazardous to store
- space for storage of stock is limited and costly

Some materials produced with recycled paper pulp include: newspapers, packaging, bags, tissue and towels, corrugated boxes, shoe boxes and files, egg cartons and fruit packing layers.

If paper and cardboard products are clean and separated into different types, significantly higher prices are fetched for the recovered materials.

3.3.4.3 Glass

Glass recovery for recycling has had a very erratic history, due to only one recycler having a monopoly in the market. When the capacity of the kilns is full, the price used to drop dramatically due to an over-supply and no demand. Fortunately this situation has stabilized and a constant market for recovered glass is currently prevailing.

The separation of glass is very successful in separation at source activities since it is easy to identify by the home owners. Recent experience in the City of Cape Town has shown that most home owners whom participate in separation at source also wash their glass products before putting it in the recyclables bag.

3.3.4.4 Plastic

Several types of plastics are typically recycled, i.e. PET (transparent plastic bottles e.g. 2 litre cool drink bottles), HDPE (milk containers), LDPE and mixed plastics. Recycled PET is used in the manufacture of small moulded products, such as handles, sporting goods and furniture. Recycled HDPE is used for producing flowerpots, dustbins and a variety of other containers. Mixed plastics are normally used for the manufacture of outdoor furniture, pallets, and plastic timber.

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The recent introduction of a levy on shopping bags has caused the amounts arriving at the landfill to reduce dramatically. Less plastic bags are disposed of, as they are recovered and are now manufactured of better quality and thicker plastic.

In order to recycle plastics using current traditional methodology, it has to be sorted into the various categories, and washed if contaminated by the other wastes. Alternative technologies are currently being evaluated (also in South Africa) that could eliminate the need for sorting of plastics.

3.3.4.5 Metal

Metals are the single most recoverable item in the waste stream. Very little degradation takes place during collection. It follows that a relatively small amount ends up in the waste stream, as all types of metal are removed for re-sale at various stages of the waste handling process.

One of the major components of ferrous wastes is the steel can (95% of all cans in the Metropolitan Areas). Non-ferrous metals such as Aluminium and Copper are very scarce in our waste streams, due to its extremely high salvaging value. These are usually removed at source.

3.3.4.6 Economic Sustainability of Waste Recovery

Although the recovery of materials of value from the waste stream for recycling or re-use is one of the basic operations in future integrated waste management, the question regarding its financial and economical sustainability should always be asked and answered.

Local experience over the last decade has shown that the South African recycling market, or rather the recycled product market, is very small and very susceptible to unforeseen activities, e.g. if one paper mill burns down, the effect on the waste paper market, and the prices, is significant. The South African "market" is simply too small to absorb these types of set-backs.

For this reason it is commendable that DEADP had a study conducted into sustaining the local recycling industry.

But one must consider the economical sustainability and not only the financial sustainability. Economic sustainability considers the whole life-cycle cost and not only the rands and cents of a specific financial year and taking into consideration the avoided costs of airspace saving and also the cost on the environment for the resultant smaller utilisation of virgin resources. An interesting stipulation in the Waste Act, Section 17 (1) (a), is that one may not recover materials from waste if it costs more environmental resources to recover, than it would to dispose of that material – a good example of the total or life-cycle costing principle.

Prices for recovered materials vary greatly from city to city and province to province, from baled to unbaled, from dirty to clean and from material type. External factors also play a significant role such as the oil price, e.g. due to a previous low crude oil price of approximately US$43 per barrel had caused new plastic to be cheaper than recycled plastic – cheaper, not necessarily more economical. The result was that recyclers at that moment (January 2009) could not even give their LDPE plastic away where only a month before it was sold for R1500/tonne. Currently, in 2018, the crude oil price is closer to US$70 which could have a positive effect on the market for recycled plastic material which has seen a recent increase in price.

The above is not an argument for or against recovery of waste, but that both recovery AND the establishment of a recycled goods market should be supported. This is an aspect that cannot be addressed on a local authority level, but must be addressed on a Provincial and/or National level to optimise economy of scale.

Benefits must also be shared. For example, if a municipality saves airspace and transport cost due to recovery, a portion of that saving (avoided costs) should be passed on to the recovery effort to ensure that it is sustainable. If not, as was proven in SA previously, the recovery effort closes down and the municipality loses its avoided cost saving.

The April 2018 prices for recovered materials delivered in Cape Town are displayed in **Table 3-17** and exclude VAT and transport costs (except for paper and cardboard).

Table 3-17: April 2018 Prices of Recovered Materials in Waste Stream

MATERIAL	PRICE IN RAND/TON FOR BALED MATERIAL
Card board	1400
White Paper	2500
Newsprint	950
Mixed Paper	600
Metals (Mainly cans)	1600
Glass (All colours, Crushed)	400
Plastic (PET, No 1, White, Blue)	4800
Green PET	3800
Plastic (PET, No 1, Brown & other colours)	3000
Plastic (HDPE, No 2)	4300
Plastic (LDPE)	Dirty 1600 Clean 3000
Plastic (Polypropylene, No 5)	1500
Plastic (Polystyrene, No 6)	No Buyers

3.3.5 Hazardous Waste Composition and Quantities

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 1 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.

The deadline for hazardous waste generators in the ODM Area to have their waste classified per SANS 10234 was August 2016 and details on how many of the generators complied with the requirement is not known since the local municipality IWMPs were all completed prior to 2016. This would thus need to be a requirement of the next generation of IWMPs for the local municipalities in the ODM.

The DEADP checklist for development of IWMPs require the local municipalities to include waste composition data for hazardous waste into their IWMP documents. The landfills and municipal waste treatment facilities with the ODM do not accept or treat hazardous wastes, although some small portions of household hazardous waste items (batteries, paint etc.) do end up on landfill.

The following headings will provide information on hazardous and priority wastes for each of the local municipalities as contained in their individual IWMPs with additional information provided where possible.

3.3.5.1 Overstrand Municipality

The Overstrand IWMP was completed by JPCE (Pty) Ltd in 2015 and included in formation on hazardous waste from a hazardous waste survey that was done in 2009.

3.3.5.1.1 Industrial Hazardous Waste

Industries were visited physically (2009) and a survey of each possible hazardous waste generator was made per industry/ occupant of a unit in an industrial park. Possible generators were evaluated in terms of the process generating waste, waste type, classification, quantity, and disposal venue.

Although the information below is from a 10 year old study, it does provide input into the possible industrial waste generation within the municipality.

Table 3-18: Quantities of Industrial Hazardous Waste Generated in Overstrand Municipality in kg/a (2009)

	A: Agriculture, Forestry & Food Production	B: Mineral Extraction & Upgrading	C: Energy	D: Metal Manufacture	E: Manufacture of Non-Metal Mineral Products	F: Chemical & Related Industries	G: Metal Goods, Engineering & Vehicle Industries	H: Textile, Leather & Wood Industries	I: Garages &Workshops	J: Manufacture of Paper Products, Printing & Publishing	K: Medical, Sanitary & other Health Services	L: Commercial & Personal Services
Hermanus								261,312	269,079	60		
Gansbaai Area	10,120							35,000	5,630			
Kleinmond Area							24,810			6		
Stanford					200				3,120			
Sub-totals	10,120				200		24,810	296,312	277,829	66		
Total	**609,337 kg/a**											

3.3.5.1.2 Health Care Risk Waste

Health Care Waste (HCW) consists of Health Care General Waste (HCGW) from offices, etc as well as Health Care Risk Waste (HCRW) arising from material contaminated with body fluids, etc.

The Overberg District Municipality published a by-law during 2015 (Provincial Gazette 7389, 15 May 2015), that allows for all Health Care Risk Waste generators to become listed and receive a Health Certificate. New Health Care Risk Waste generators must apply to the ODM for permission to operate in the region and dispose of Health Care Risk Waste in a responsible manner.

There are various Health Care Risk Waste generators in the Overstrand municipality of which the major generators are the two hospitals including the provincial clinics.

Most of the Health Care Risk Waste generators are very responsible in the storage, handling and disposal of the waste.

Types of Health Care Risk Waste:

There are various types of Health Care Risk Waste generated namely:

- Sharps consist of injection needles, blades and often broken glass ampoules.
- Contaminated bandages and materials man contain any material contaminated with body fluids such as plastic gloves, drip tubing, contaminated cotton wool, bandages, etc. Often, syringes are also added to this container.
- Anatomical parts from theatre amputations, etc.
- Foetuses and placentas from abortions and births arise in the paediatric wards.
- Blood as Health Care Risk Waste is generated mostly in theatre as well as pathological laboratories.
- Expired pharmaceuticals has usually reached the end of its shelf life
- Carcasses are generated at the veterinary institutions such as the SPCA, TEARS and the veterinary consulting rooms. The carcasses are usually euthanized animals.
- Uncontaminated pressurised containers are usually separated and disposed of as general waste.
- Radio-active Health Care Risk Waste is generated by iodine type drips used for analytical purposes or cancer treatment medication. Health Care Risk Waste that may be removed as low radio-active Health Care Risk Waste for treatment and/or disposal must be below 74 Bq/g.

Table 3-19: Quantities of Health Care Risk Waste in Overstrand Municipality (2009)

Generator	Health Care Risk Waste Types in kg/a							
	Sharps	Contaminated materials	Blood and blood Health Care Risk Waste products	Fetus & placentas	Anatomical Health Care Risk Waste	DA nappies	Carcasses	Expired pharmaceuticals
General Practitioners and dentists	1,804.11	4,444.00						
Forensic Unit	16.5	1,560.00						
Pathcare	16.5		400.00					
Old Age Homes	38.94	60.0				83,700.00		
Home based Frail Care	6.6							
Funeral Homes	182.0							
Medi-city Hospital &pharmacy	918.72	9,480.0	240.00	37.1				8.0
Provincial Hospital	2,195.5	16,972.5		1,820				
Provincial clinics	1,401.5	4,300.0						
Pharmacies & Private clinics	233.64							
Veterinary	50.25	2,320.0					8,824.0	
SUB-TOTALS	6,864.28	39,776.5		1,857.1		83,700.0	8,824.0	8.0
TOTAL	**141,029.88 kg/year**							

Health Care Risk Waste Treatment Facilities

There are no Health Care Risk Waste treatment facilities in the Overstrand area. Almost all the Health Care Risk Waste is taken across the municipal border for treatment and disposal at Health Care Risk Waste facilities in Cape Town.

Euthanized pets are mostly incinerated by Greg's Pets in Worcester and/or Somerset West while euthanized animals from the SPCA and TEARS are disposed of at Karwyderskraal landfill.

Health Care Risk Waste Contractors Operating within Overstrand

The major Health Care Risk Waste contractors operating in the area according to the IWMP are:

- Canon Hygiene in Milnerton
- Pambhile Wasteman
- BCL in Delft
- Pathcare Laboratories: Pathcare is the only contractor that collects from the doctors and does not treat the Health Care Risk Waste as well. Pathcare employs Canon to collect and treat the Health Care Risk Waste received from private practitioners.
- Psychem in Black Heath
- Millennium Waste in Bellville
- Steinmed in Cape Town
- Solid Waste Technologies (SWT) in Killarney Gardens

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All of the contractors incinerate by using the BCL, Enviroserv and Psychem incinerators in Delft, Vissershok and Blackheath except Pambile Wasteman. Solid Waste Technologies provides a HCRW treatment service to Phambile Wasteman. SWT operates an Electro-thermal Deactivation Plant (EDP) in Killarney for the destruction of Health Care Risk Waste excluding anatomical, fetuses and pharmaceutical Health Care Risk Waste.

Final disposal takes place in the Vissershok hazardous landfill operated by the City of Cape Town.

3.3.5.2 Cape Agulhas Municipality

The 2016 3rd generation IWMP by Chand Environmental Consultants contained no information.

3.3.5.3 Swellendam Municipality

3.3.5.3.1 Introduction

The 2015 IWMP by Mott MacDonald provides an overview of what is defined as hazardous waste and how it is classified. It goes on to state that hazardous waste is produced mainly by industries and health care facilities with businesses occasionally also contributing to the waste stream. In SLM the healthcare facilities were reported to be the main producers of hazardous waste.

The IWMP reports that household hazardous waste such as batteries and compact fluorescent lights (CFLs) were included in the general waste stream, which was disposed of at the Bontebok WMF. These wastes contain highly toxic substances such as mercury and cadmium, which can, in small amounts, contaminate large volumes of groundwater when disposed of at WMFs. These waste items decompose very slowly and therefore accumulate in the soil.

3.3.5.3.2 Health care risk waste

HCRW comprises the hazardous component of the health care waste stream. HCRW has the potential of a number of environmental, health and safety risks, depending on the waste type and the manner in which it is handled.

In terms of implementing the waste hierarchy, the key challenges in terms of HCRW management lie in the safe treatment and disposal of this waste. Health care services originating in the SLM area are given below:

Clinics:
Barrydale Clinic
Buffeljagsrivier Clinic
Railton Clinic
Suurbraak Clinic

Hospitals:
Swellendam Hospital

Mobile Clinics:
Barrydale Mobile Clinic
Rûens Mobile Clinic
Swellendam Mobile Clinic
Swellendam Municipality Mobile Clinic

All public clinics and hospitals are under the control of the Department of Health: Western Cape Province. Environmental Health Practitioners, who are stationed at hospitals, are responsible for the control of waste management at hospitals and clinics, being under the supervision of a Chief Environmental Health Practitioner. In the SLM, HCRW from all clinics is transported to Swellendam Hospital for collection and then taken to Vissershok hazardous WMF in Cape Town.

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3.3.5.4 Theewaterskloof Municipality

The Caledon Provincial hospital has a waste incinerator where the health care waste from the towns in Theewaterskloof are incinerated.

The dangers:

Household hazardous waste include products that contain ingredients that are either toxic, flammable, corrosive or reactive. These can be for example paint, oils and pesticides (from farms as well). If improperly disposed, for example pouring down the drain or dumping at the wrong site, these substances are harmful to the environment and human health and can have long-term effects.

Electronic waste such as computers and televisions contain many hazardous substances and heavy metals. Acidic conditions when these wastes are landfilled can cause the heavy metals to leak out. If this happens on a landfill which is not properly lined, the environment gets contaminated and may even contaminate groundwater.

3.4 EXISTING WASTE MANAGEMENT STRUCTURE, SYSTEMS AND PRACTICES

As the District Municipality is not responsible for weekly waste collection, there is not a large labour intensive staff compliment as with the local Municipalities. The waste management function resides within the environmental management section of the ODM.

3.4.1 Operational Structure and Staff Capacity

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 matter 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 the Overberg District Municipality is Mr Francois Kotze who was appointed by Council as required by the Waste Act. Mr Kotze is also the Manager of the Environmental Management Services Department.

Provision must be made for the continuous training and education of the ODM waste management employees. Waste management information sharing/capacity-building events such as the Regional Waste Forum, Waste Khoro and Wastecon should be attended by waste management employees determined by the Municipality.

The approved Organisational structure has been included below, there is no specific solid waste department and the duties are given to a Solid Waste Management Division that falls under the Department of Environmental Management Services. The ODM plans to create a position for a waste management official to assist the ODM waste management officer in his/her duties.

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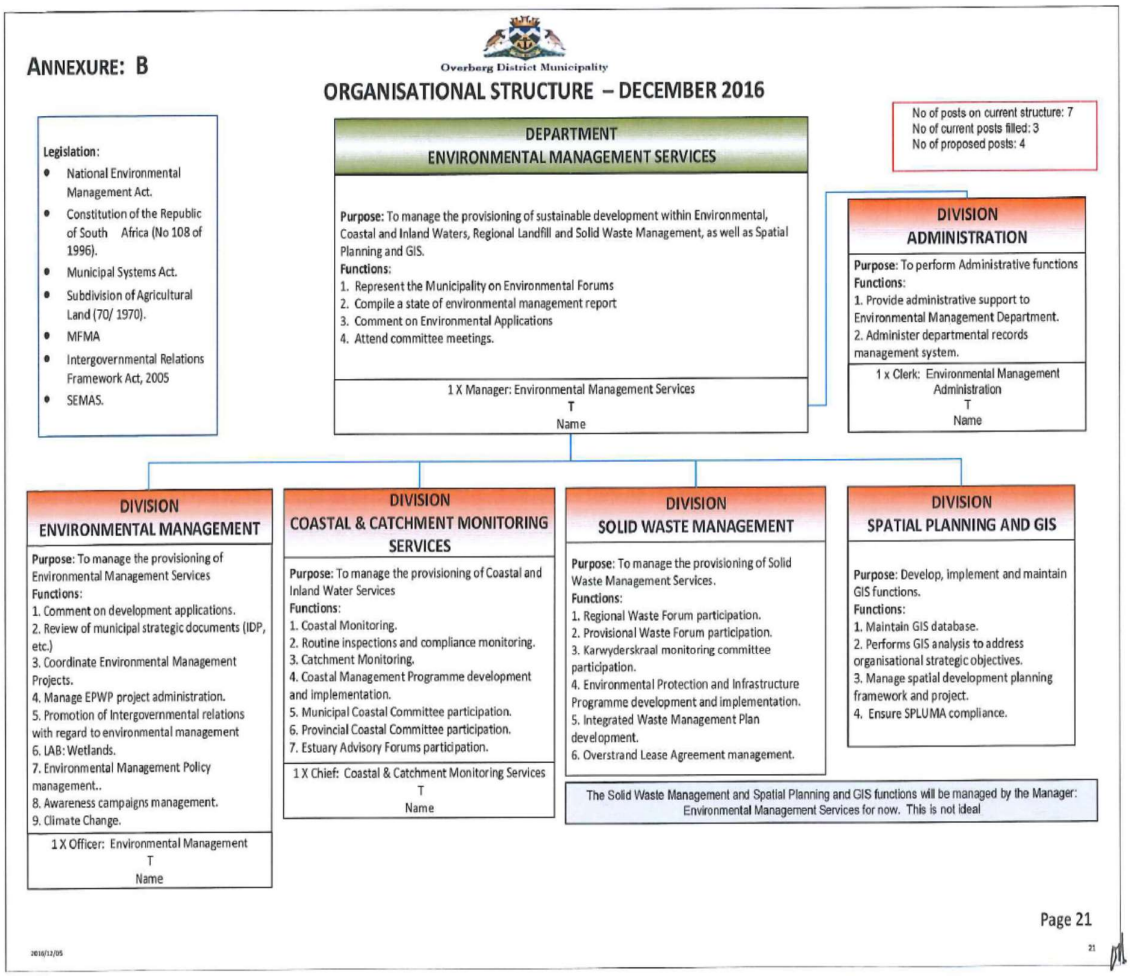

3.4.2 Waste minimisation, re-use, recycling initiatives

All the local municipalities within the ODM realise the importance of waste minimisation, re-use and recycling. Diverting waste from landfill starts with avoiding the generation of waste wherever possible. The following diagram illustrates a simplified version of the well-known waste hierarchy with Avoidance being the most favourable and Disposal the least favourable:

3.4.2.1 Waste Avoidance

Waste avoidance refers to a pro-active approach by industrial as well as domestic waste producers to minimize the volume of waste, by not creating the waste in the first place.

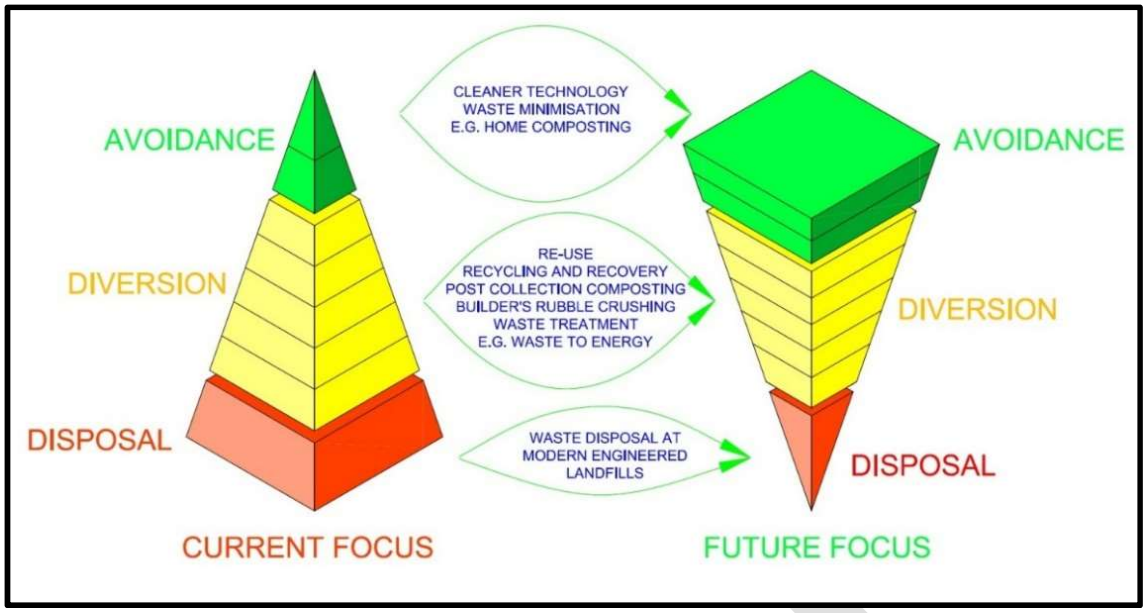

Figure 3-4: Waste Hierarchy

Waste avoidance is a "beginning of the pipe" action that can only work when people understand the full process depicted above.

At the moment waste minimisation through recovery (second tier) is considered a priority in South Africa. Once that can be successfully implemented and the people are educated in the importance of waste reduction, recovery at source (third tier) can be implemented with a reasonable chance of success.

It therefore follows that waste avoidance will be the ultimate and final step in this education process.

In the home, waste avoidance can be practiced by similar efforts where items are used for different purposes than the original intent, possibly suggesting that one purchases alternative products to the norm. Home composting is also considered waste avoidance, as the waste material is converted into a useful gardening resource whilst avoiding the raw product entering the waste stream.

Presently the avoidance of waste in industry has a financial detrimental implication in most cases (e.g. alternative raw products), and only large companies are able to take the leading role through their international experience in this field. Regulatory controls will only be effective if fines result in legal compliance being cheaper than non-compliance. In South Africa, resource and disposal costs are low, providing no financial incentive to reduce consumption or waste in industry. It follows that regulatory instruments are required for implementation on a Municipal level to govern the avoidance of industrial waste in the District.

Regular audits should be conducted by an independent entity on the avoidance practices, to form a basis for applying incentives / penalties. An important tool for monitoring purposes is a proper Waste Information System (WIS). The District Municipality should ensure that all the local Municipalities report to the IPWIS. Without a doubt, waste avoidance will become a real and enforced issue in South Africa in the near future, and must be addressed in any Municipal Waste Strategy.

In the Overberg, the best place to start implementing waste avoidance would be at the well-established industries on a voluntary basis. A joint venture effort between such industries and the Municipality may be mutually beneficial.

The industry will receive positive advertising of these "green" initiatives through the media, whilst the Municipality will be taking a leading role in South Africa through pro-actively spawning waste avoidance to the benefit of the community and the environment.

The local Municipalities can promote waste avoidance through leading by example. Many opportunities exist where small changes can result in waste avoidance. One example is the option to have paperless meetings. If officials have access to laptops or tablets they need not receive the agenda on paper and can keep track and make notes digitally. Wherever it is not necessary to print and use paper, it can be avoided.

Successful waste avoidance will result in further lowering of the demand on the Overberg waste management infrastructure and the functions of collection, recovery and disposal will be done more efficiently by the local municipalities.

Awareness and education plays a crucial role in waste avoidance. Today's consumerism focussed society results in waste being created in the home without thinking of the consequences before buying. A very large part of our waste streams can be avoided by an educated and aware public, focussing on the avoidance of waste before minimisation and eventually disposal.

3.4.2.2 Recycling

3.4.2.2.1 Overstrand

In the Overstrand Municipality Waste recovery is done by Walker Bay Recycling at the Hermanus MRF and Enviroserv at the Gansbaai MRF. JPCE (Pty) Ltd receives regular data on waste processed at these facilities through its appointment with the Overstrand Municipality.

At Hermanus MRF the following mainline recyclables are recovered from the waste stream on a monthly basis (**Table 3-20**). The numbers shown are monthly averages for the year February 2017 to February 2018 although data is available from as far back as 2010.

Table 3-20: Hermanus MRF Recycling Figures

Waste Fraction	Recovered Ton/month)
Glass	53.98
Cardboard	37.10
HL 1 (white office) Paper	11.87
Paper	28.59
CMw (mixed) Paper	7.36
Tins	5.46
Plastic	7.32
PET	8.36
HD	2.90
Other	1.56
TOTAL	**164.74**

Ferrous (±65 tons/month) and Non Ferrous (±5 tons/month) metals are also recovered at the MRF but the Walker Bay Recyclers are also scrap metal dealers involved with recovery of cars etc. so the numbers in the table are more related to municipal waste management.

At Gansbaai MRF the recovered tonnages as an average monthly value for the year February 2017 to February 2018 is shown in **Table 3-21**.

Table 3-21: Gansbaai MRF Recycling Figures

Waste Fraction	Recovered Ton/month)
Glass	9.75
Cardboard	10.90
Paper	10.60
Plastic	3.51
Light Steel	3.51
TOTAL	**38.27**

This total monthly average of just over 200 tons represents a total diversion from landfill of between 2% and 5% by weight through recovery of recyclable materials. When compared to the estimated amount of recyclables expected in the Overstrand waste stream based on the population figures and assumptions on characterisation (**Table 3-16**), it shows that the municipality recovers about 30% of the available paper in the waste stream, 10% of the plastics and 55% of the glass.

Although the generation tonnages are based on assumptions and the recycling tonnages are measured, it does show that public participation rates of separation at source collection and market fluctuations play a major role in the recovery potential of materials.

3.4.2.2.2 Cape Agulhas Municipality

The CAM contribute to the recycling of waste materials through contracting to a private party. The municipality does not own or operate any recycling infrastructure. The Municipal Waste Manager reported that an average of 100 tons of material per month is diverted from landfill through recovery of mainline recyclables. This represents a total diversion from landfill through recycling of 7%. It must, however, be noted that both the values of recycling and disposal are estimated since the municipality has no weighbridges or methods of record keeping at the treatment facilities.

3.4.2.2.3 Swellendam Municipality

The SM contribute to the recycling of waste materials through contracting to a private party called Agri World SA. The municipality does not own or operate any recycling infrastructure and waste is separated at the Bontebok landfill site in Swellendam by Agri World and transported to the private party's Material Recovery Facility in town.

The reported tonnages for mainline recyclable material recovered in this way is on average 85tons per month with tonnages of more than 100 tons per month reported for some months. This represents a total diversion from landfill through recycling of 6%. It must, however, be noted that both the values of recycling and disposal are estimated since the municipality has no weighbridges or methods of record keeping at the treatment facilities.

3.4.2.2.4 Theewaterskloof Municipality

The 2014 IWMP reports that no recycling facilities or projects had been established by the Municipality at that time. There were reportedly some private recyclers operating in the Theewaterskloof Municipality. TWK Recycling & Waste Management is a private recycling company based in Grabouw where collections from Botrivier, Caledon, Genadendal, Greyton, Riviersonderend and Villiersdorp are sorted and processed for recycling. They started recycling operations in 2011. They are actively training and supporting local entrepreneurs to be successful in the recycling industry. The 2014 IWMP reported that TWK recycling had planned on expanding their footprint to serve a larger area within the municipality with recycling services. TWK Recycling provided the information in **Table 3-22** below for the last three years ending in February.

Table 3-22: Theewaterskloof Recycling Numbers

TWK Recycling & Waste Management			
Annual Product Input Stats			
Item	Feb '16	Feb '17	Feb '18
	tons	tons	tons
Glass	47.76	93.55	104.53
PET	16.87	39.61	46.55
LD Film	12.79	15.11	14.65
LD Consol	0.36	6.99	5.76
Wrapping	0.00	0.00	0.02
Polyprop	0.00	0.25	0.66
Mix - HD & PET	3.63	3.53	2.77
HD	14.82	27.69	3.65
Crates	2.65	7.13	8.25
Plastic Drums	2.34	0.34	0.23
Caps	0.68	0.79	0.94

TWK Recycling & Waste Management			
Annual Product Input Stats			
Item	Feb '16	Feb '17	Feb '18
	tons	tons	tons
Chemical Cans	9.55	22.23	32.68
Black pipe	17.77	8.97	26.33
Cardboard	87.80	133.54	186.25
White Paper	10.87	11.60	13.55
Newspaper	5.23	4.80	4.87
Magazines	0.02	1.27	0.90
Paper Mixed	0.40	3.24	4.42
Cans / Tins	8.83	18.86	22.56
Light Steel	4.45	11.18	9.56
Heavy Steel	5.10	17.83	17.50
Aluminium	0.22	38.00	0.04
Brass	0.00	0.00	0.00
Copper Half	0.10	0.00	0.00
Copper Shiny	0.00	0.00	0.05
Battery	0.98	0.00	0.05
TOTALS	**253.22**	**466.51**	**506.77**

3.4.2.3 Organic Waste Diversion

Organic waste is mostly made up of garden waste, food waste and wood waste. Food waste forms part of the general waste stream and ends up on landfill by being mixed in with the other waste streams from homes and businesses within the municipalities. None of the local municipalities within the ODM collects garden waste from kerbside for disposal on the landfills and residents are generally expected to bring their garden waste to the drop offs and transfer stations for treatment. In order to economically and sustainably operate a composting facility, the rule of thumb is that you need an estimated 350tons or organic waste per month. From the calculated generation rates given earlier, it is clear that none of the four local municipalities has the potential to produce quite enough organic waste for the sustainable operation of a large scale composting plant. The volumes are, however, significant enough to encourage diversion through composting and composting is done successfully at the ODM's Karwyderskraal landfill which receives waste from more than one local municipality. Diversion is thus achieved at Karwyderskraal and the facility is currently in the process of developing an Organic Waste Diversion Plan for the landfill in order to further reduce the volume of organic waste going to landfill.

Overstrand

The Overstrand Municipality are actively involved in the diversion of organic waste from landfill. They chip the garden waste at the waste treatment facilities and use it for compost and/or cover material. During the 2017 financial year the municipality used a total of 753 tons of chipped garden waste (average of 63 tons per month) as cover material on the Gansbaai Landfill. This translates to an average of 3% diversion of waste from landfill during this time. During this same time diversion of organic waste from the Karwyderskraal through composting of chipped garden waste totalled 12,200 tons which translates to a diversion of 16% during that year.

Cape Agulhas

The municipality is not actively engaged in organic waste diversion and organic waste from residents and businesses end up on landfills through direct disposal, transfer stations and drop offs. Some small scale individual composting initiatives assist in diverting some of the organic waste from landfills but the tonnages or volumes are unknown due to the lack of weighbridges.

Swellendam

The municipality is not actively engaged in organic waste diversion and organic waste from residents and businesses end up on landfills through direct disposal, transfer stations and drop offs. Some small scale individual composting initiatives assist in diverting some of the organic waste from landfills but the tonnages or volumes are unknown due to the lack of weighbridges.

Theewaterskloof

Accurate data on the organic waste quantities are not readily available and further investigation into the different organic waste streams is required. Obtaining quantities and identifying the generators of these wastes will enable the Municipality to ensure that it is correctly handled and disposed without becoming a threat to human health or the environment. There is a composting plant next to the Grabouw transfer station where some of the garden waste is mixed with the sludge from the adjacent WWTW and turned into compost.

3.4.3 Awareness & Education

The lack of public awareness of the gravity of the problem of sustainable waste management has a significant impact on the effectiveness of the management of waste.

Our poor history of waste management in South Africa means that we pay little attention to our lifestyle insofar as how it affects the environment. However, when an environmental problem is noted and the public are made aware of the need for action, there is no stronger lobby. This has been evident with the recent water crisis in the Western Cape. This situation has caused that people in the province have actively been involved in water saving initiatives and the volume of water being used in the province has decreased massively in the last two years. People are looking at sustainable ways of using water and will continue to do so since it is now public knowledge that water is a scare resource in the province (and the country for that matter). Creating awareness of the issue of sustainable waste management may have a similar outcome. With landfill airspace becoming more and more restricted, alternative options minimising or avoiding the need for disposal becomes necessary.

The successful implementation of the ODM IWMP will require that all persons within the Municipal boundaries are aware of waste issues as an integral part of the creation of a healthy environment. They should be empowered to play their specific role in the development and implementation of the waste management initiatives.

Public participation is closely linked with education and public awareness. The significant difference between awareness programmes and public participation is that public awareness focuses on disseminating information, whereas public participation aims at obtaining participation, comment, input and feedback from the public.

The local municipalities within the ODM undertake waste awareness and education campaigns through spreading information in bulletins and newsletters, recycling at school campaigns and distribution of flyers etc. Although these practices are well received and need to continue, the level of awareness and education needs to increase even more and the ODM need to play a leadership and oversight role in this space by providing the local municipalities with everything that they need to be successful in raising awareness of proper waste management.

In cooperation with the National Department of Environmental affairs, Local Government including the ODM support the following awareness campaigns as rolled out throughout the district as part of calendar celebrations. These campaigns are focusing on both primary and high schools:

- Waste management (Recycling);
- Environmental Conservation and the impact of pollution;

Supporting the DEA Youth Jobs in Waste and related clean-up projects, project awareness campaigners are instrumental in undertaking door to door awareness in residential areas and to local businesses. The focus:

- To provide awareness regarding waste hazards to the environment and human health.
- To provide different ways to Avoid, Reduce, Recycle waste
- Inform communities regarding municipal recycling initiative (three bag system) and who should be contacted in the municipality regarding was related complaints.

Annual provincial clean-up campaign: Coastal Cleanup and awareness initiative linked to the International Coastal Cleanup.

3.4.4 Waste Treatment Facilities

3.4.4.1 Introduction

JPCE undertook a study for DEADP in September 2016 to assess the infrastructure requirements of all waste treatment facilities within a number of District Municipalities in the Western Cape, including the ODM. Information from this study was combined with information in the local municipality IWMPs to assess the status of waste facilities within the ODM.

The Overberg District consists of the local municipalities listed below. All of the facilities that are located in each of these municipalities are also listed in **Table 3-23** below.

Each of the local municipalities has waste management infrastructure for the treatment or disposal of municipal waste. The Overberg District Municipality also owns and operates a landfill, and whilst the facilities of the local municipalities will be listed and briefly commented on, the ODM owned Karwyderskraal landfill will be discussed in more detail.

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Table 3-23: Waste Treatment Facilities in the ODM

Facility	License Number	Status	Class	Location	Comment
Overstrand Municipality					
Betty's Bay Drop-off	Not required	Operational	N/A	34°21'12.62"S,18°51'32.54"E	2 x 30m^3 containers on site as well as stockpiled Garden Waste and Builder's Rubble. Toilet and drinking water available on site.
Betty's Bay Landfill	12/9/11/P18	Closed and Rehabilitated	GCB-	34°21'19.78"S, 18°51'45.92"E	Landfill no longer in use. Closed and Rehabilitated.
Fisher Haven Landfill	19/2/5/1/E2/8/WL0035/14	Closed	GCB-	34°21'57.16"S, 19°7'31.79"E	Licensed for closure but not yet rehabilitated.
Gansbaai Landfill	16/2/7/G400/D24/Z1/P335	Operational	GMB-	34°35'14.33"S, 19°21'53.65"E	Also contains a MRF and Garden Waste Chipping Area. Gas probes recently installed.
Hawston Drop-off	Not required	Operational	N/A	34°22'37.34"S, 19°7'42.25"E	Storage capacity less than 100m^3.
Hawston Landfill	19/2/5/1/E2/13/WL0088/12	Closed	GCB-	34°23'17.65"S, 19°8'25.61"E	Licensed for closure but requires fencing and final rehabilitation.
Hermanus Landfill	19/2/5/1/E2/14/WL0089/12	Closed	GCB-	34°25'25.50"S, 19°12'53.10"E	Shaping of final waste body complete but final capping and rehabilitation required.
Hermanus RTS & MRF	16/2/7/G403/D2/Z2/P457	Operational	GMB+	34°25'29.31"S, 19°13'3.98"E	Recent vandalism occurred and facility needs to be repaired.
Kleinmond Landfill	12/9/11/L17/9	Closed and Rehabilitated	GCB+	34°20'7.31"S, 19°0'21.45"E	Soccer filed built on closed landfill. Does require gas monitoring and fencing.
Kleinmond RTS	16/2/7/G401/D21/Z2/P458	Operational	GSB+	34°20'11.92"S, 19°0'16.43"E	Recent vandalism occurred and facility needs to be repaired.
Onrus Landfill	19/2/5/1/E2/26/WL0034/14	Closed	GCB	34°24'21.25"S, 19°10'33.81"E	Closed for more than 10 years. Final Capping not done.
Pearly Beach Drop-off	Not required	Operational	N/A	34°39'51.69"S, 19°30'14.41"E	3 x 30m^3 containers + 1 x 6m^3 skip. Storage Capacity less than 100m^3
Pringle Bay Drop-off	Not required	Operational	N/A	34°20'33.46"S, 18°50'38.51"E	5 x recycling igloos and 7 x 700l wheelie bins (<100m3)
Stanford Drop-off	Not required	Operational	N/A	34°26'49.10"S, 19°27'23.60"E	2 x 30m^3 Containers + 1 x 6m^3 skip for glass and 1 x 30m^3 container for garden (<100m^3)
Stanford Landfill	19/2/5//1/E2/36/WL0087/12	Closed	GCB-	34°28'2.40"S, 19°26'46.53"E	Closed for more than 10 years. Issued with Closure license
Voëlklip Drop-off	Not required	Operational	N/A	34°24'44.90"S, 19°18'20.70"E	2 x 30m^3 containers + 1 x 6m^3 skip for recyclables
Voëlklip Landfill	19/2/5/1/E2/40/WL0049/14	Closed	GCB-	34°24'38.81"S, 19°18'26.40"E	Closed landfill. Requires final Capping

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Cape Agulhas Municipality					
Bredasdorp Landfill	16/2/7/G501/D1/Z1/P329 and 19/2/5/4/E1/5/WL0130/14	Operational	GSB-	34°31'19.09"S, 20° 4'16.11"E	Area for new cell is fenced. Encroachment of residential area a concern.
Elim Landfill	16/2/7/G501/D3/Z2/P337	Operational (earmarked for closure)	GCB-	34°36'13.23"S, 19°45'20.23"E	Waste from Elim is transferred by a private contractor to Bredasdorp for final disposal.
L'Agulhas Landfill	19/2/5/1/E1/1/WL0006/14	Closed	GCB-	34°49'20.43"S, 20° 0'31.00"E	Has not been used in years. Closed but final capping not done.
Napier Drop-off	12/9/11/P40	Operational	GCB-	34°27'58.55"S, 19°54'8.55"E	Fencing in place.
Napier Landfill	19/2/5/1/E1/10/WL0010/14	Closed (Garden Waste Only)	GCB-	34°27'57.15"S, 19°54'10.84"E	Closed site receiving garden waste only. Requires final capping
Struisbaai Drop-off	12/9/11/P39	Operational	GCB-	34°47'28.30"S, 20° 1'48.38"E	Located on old landfill. Fencing in place.
Struisbaai Landfill	19/2/5/1/E1/13/WL0008/14	Closed (Garden Waste Only)	GCB-	34°47'29.77"S, 20°1'42.61"E	Licensed for closure. Still receives garden waste. Final capping not done.
Waenhuiskrans Drop-off	12/9/11/P13	Operational	GCB-	34°40'25.58"S, 20°13'17.36"E	Fenced. Waste goes to Bredasdorp landfill
Waenhuiskrans Landfill	19/2/5/1/E1/7/WL0009/14	Closed (Garden Waste Only)	GCB-	34°40'26.76"S, 20°13'15.13"E	Licensed for closure. Still receives garden waste. Final capping not done.
Swellendam Municipality					
Barrydale Landfill	19/2/5/1/E3/10/WL0005/14	Closed	GCB-	33°54'22.43"S, 20°42'25.91"E	Issued with Closure license. Some illegal dumping. Final rehabilitation not done.
Bontebok Landfill	B33/2/800/9/S/P171	Operational	GMB+	34°2'4.08"S, 20°27'57.76"E	New Cell required. Landfill license amendment required to increase/confirm footprint.
Cape Infanta Landfill	19/2/5/1/E3/6/WL0056/14	Operational (Garden Waste Only)	GCB-	34°24'54.91"S, 20°50'35.82"E	Although not closed officially, the waste is transported to Swellendam and this site is only used as garden waste site.
Malgas Landfill	19/2/5/1/E3/10/WL0012/14	Closed	GCB-	34°21'46.73"S, 20°37'17.69"E	Closure license issued. Final Capping not done. Receives garden waste.
Suurbraak Landfill	B33/2/800/98/S/P236	Operational (Garden Waste Only)	GCB-	34°0'53.43"S, 20°38'57.70"E	Although not closed officially, the waste is transported to Swellendam and this site is only used as garden waste site.

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Theewaterskloof Municipality					
Botrivier Drop-off	Not required	Operational	N/A	34°14'0.60"S,19°12'20.30"E	2 x 30m^3 containers (<100m^3)
Caledon Landfill	16/2/7/G400/D4/P259	Operational	GSB+	34°12'54.20"S, 19°25'22.30"E	Near capacity. Requires closure license and closure.
Genadendal Landfill	19/2/5/1/E4/9/WL0091/14	Operational (earmarked for closure)	GCB-	34°3'22.23"S, 19°34'7.39"E	Has received a closure license and will require rehabilitation
Grabouw RTS	16/2/7/G401/D15/Z2/P472	Operational	GSB+	34°9'25.32"S, 19°1'16.30"E	Fenced and recently extended
Greyton Landfill	19/2/5/1/E4/12/WL0090/14	Operational (earmarked for closure)	GCB-	34°3'47.23"S, 19°36'8.85"E	Has received a closure license and will require rehabilitation
Riviersonderend Landfill	19/2/5/1/E4/20/WL0033/14	Operational (earmarked for closure)	GCB-	34°8'6.25"S, 19°55'40.68"E	Has received a closure license and will require rehabilitation
Villiersdorp Landfill & RTS	16/2/7/H600/D70/Z1/P356	Operational	GCB-	33°58'36.30"S, 19°17'6.00"E	Landfill not operational for general waste. Waste transferred to Karwyderskraal

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3.4.4.2 Karwyderskraal Landfill

The landfill was issued its first Permit in terms of the Environmental Conservation Act, 1989, Permit Number 16/2/7/G501/D3/Z3/P374 in March 2000, and an amendment to the permit was issued in November 2005 to include a composting area.

The facility is permitted as a G:M:B+ landfill and has been operational since February 2002. The infrastructure and first cell, Cell 1, was completed towards the end of 2001. Subsequently construction of Cell 2 was completed in April 2005 and Cell 3 in February 2015. The design for the next cell (Cell 4) was completed by JPCE in 2017 and construction of the cell commenced in July 2018.

The site was developed by the ODM to partially serve the waste disposal requirements of the Overstrand Municipality as well as the Theewaterskloof Municipality. As a result of the distances between the main waste generating areas and the Karwyderskraal Regional Landfill Facility, a number of waste transfer stations have been developed throughout the main waste generating municipal areas.

The disposal site is situated at the junction between the D1254 and Minor Road 6, approximately 3 km from the turn off from the R43. The road surface leading to the disposal area is surfaced until past the weighbridge and workshop areas; from there a gravel road leads to the active cells / tipping areas. Refer to **Figure 3-5** for a locality map and to **Table 3-24** for descriptions of the activities at the facility.

The landfill is operated as a G:M:B$^+$ (Class B) landfill and has the following existing facilities:

- Entrance control room with a 22m weighbridge
- Offices, ablution facilities and board room
- Workshop
- Polluted storm water dam
- Temporary lined leachate storage area / dam
- Cells 1, 2 & 3 (cell 4 under construction and due for completion early 2019)
- Storm water infrastructure
- The site is fenced of around the perimeter and access into the site is via an automated electronic gate
- Electricity supply
- Water supply

Since the landfills in other areas of the ODM are nearing capacity or are under pressure with non-compliance of license conditions due to budget and technical related matters, the Karwyderskraal landfill could be developed as a long term solution for waste disposal in the whole of the district. Due to the challenges faced by Swellendam Municipality at the Bontebok landfill and by Cape Agulhas Municipality at the Bredasdorp landfill, a study was recently undertaken to determine the feasibility of developing a new regional landfill site for the two municipalities. Although the outcome of this study had not yet been adopted, one of the options identified was to close the municipal landfills in Bredasdorp and Swellendam, develop RTS/MRF facilities at these locations and transport the waste to the Karwyderskraal landfill for final disposal. Should this decision be taken, the airspace and disposal charge calculations would have to be re-assessed as well as the planning for development of future cells.

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Figure 3-5: Karwyderskraal Landfill

Table 3-24: Karwyderskraal Landfill Information

Item	Information
Status	Operational
Class	G:M:B+
Location	34°19'52.93"S, 19°9'40.31"E
Buffer	730m
External SW drainage	Yes
SW channel depth more than 500mm	Yes
External SW Freeboard	>0.5m (some areas less)
Internal Clean SW	Yes
SW channel depth more than 500mm	Not all, but most yes
Enough space between waste and fence for SW channel	Yes
Contaminated SW/Leachate Dam	Yes
Contaminated SW/Leachate Dam Freeboard	>0.5m
Stable slopes flatter than 1:3	Yes
Maximum Height	Currently 24m (Permit allows 45m)
Sanitation Facilities	Yes
Notice Boards	Yes
Operating hours	Yes
Prohibit entry	Yes
Allowable waste	Yes
Person in charge	Yes
3 languages	Yes
Fence	Yes
Lockable Gate	Yes
Service roads	Good
Movable fences	No
Gas monitoring network	No
Monitoring Boreholes with lockable caps	Yes
Monitoring Boreholes (open) and operational	-

Item	Information
GPS of Boreholes	34°20'23.75"S, 19°9'44.34"E 34°20'16.58"S, 19°9'57.49"E 34°20'15.21"S, 19°0'1.67"E 34°20'7.97"S, 19°9'54.20"E 34°20'6.48"S, 19°9'41.32"E 34°19'56.11"S, 19°9'43.19"E
Office/Shelter	Yes
Access control, weighbridge, volume records	Yes, Yes, Yes
Additional comments	External and Internal Audits are undertaken as per the license requirements. No major issues had been identified during recent audits of the facility.

3.4.4.3 Elim Landfill

The waste licence for the Elim landfill is still in the name of the ODM due to historical transfer of duties of municipalities. As discussed under the legislation chapter of this report, the duties and functions of a District Municipality is clearly set out in the Municipal Structures Act and this does not include operation of a municipal town landfill. The ODM can only be responsible for a landfill if it serves more than one local municipality. The ODM is in the process of addressing and correcting this matter.

3.5 ECONOMICS AND FINANCING OF SOLID WASTE MANAGEMENT PRACTICES

3.5.1 Current Solid Waste Management System Costs & Budget

Table 3-25 shows the totals for the Capital Budget and the Operating Budget for the Overberg District Municipality as far as it pertains to the Karwyderskraal Landfill.

Table 3-25: ODM Waste Management Capital and Operational Budgets

ITEM:	2017/2018	2018/2019	2019/2020	2020/2021
CAPITAL COSTS:				
Construction of Cell 4	**R218 245**	**R20 868 572**	**R1 095 898**	**-**
Construction Cost		19 439 853	1 023 150	
Prof Fees	218 245	363 740	72 748	
Construction Monitoring		322 500		
Construction Quality Assurance on Liner installation		542 507		
ECO & H&S		120 000		
Construction Disbursements		79 972		
Other Capital Costs		**R1 830 000**	**R87 500**	
Weighbridge PC		12 000		
Backup Battery and Inverter		5 500		
Operational EMP		30 000		
Replacement Boreholes for monitoring		120 000		
Entrance road reconstruction		1 662 500	87 500	
OPERATIONAL COSTS:				
Operation of Cell 4		**R1 757 600**	**R3 823 126**	**R3 877 724**
Tender process		40 000		
Operating Cost		1 592 600	3 550 966	3 615 284
Contract Admin		50 000	108 000	116 640
External Audit		20 000	43 200	46 656
Water & Gas monitoring		30 000	64 800	69 984
Annual survey		25 000	27 000	29 160
Weighbridge Calibration (every 2nd year)	25 000		29 160	

ITEM:	2017/2018	2018/2019	2019/2020	2020/2021
Maintenance & Other Costs **	**R441 288**	**R718 154**	**Review annually in consultation with user municipalities**	
Maintenance on Pipework	91 800	29 634		
Maintenance on Fence	75 168	32 742		
Clearing of alien vegetation	151000	24 750		
Committee Meetings	18 684	4 100		
Signage	21 600	600		
Site Visits	65 772	18 000		
Water & Electricity	64 800	69 984		
TWK Network Connection	11 664	12 597		
Subsistence and Travel		50 864		
Interdepartmental Charges		29 634		

** The Maintenance and Other costs are estimated values that are to be reviewed annually and adjusted for the following year as applicable.

The cost of operating the KWK landfill is covered by the contributing municipalities which at the moment is limited to the Overstrand and Theewaterskloof local municipalities. They pay a fixed monthly cost to repay capital and a varying monthly cost linked to actual tonnages disposed which is used for the operation of the facility. There is an additional rehabilitation cost charged to the users of the site (per ton) for the ultimate capping and rehabilitation of the facility.

The ODM manages two public holiday resorts namely Uilenkraalsmond and Die Dam. Both resorts provide their own waste collection service on a weekly basis and disposes of their solid waste at the Gansbaai Solid waste disposal facility.

The total volumes of waste received at the Gansbaai landfill from these areas, for the year July 2017 to June 2018 411.95 tons. This equates to an average of 34.33 tons per month and is made up on average of 77% general waste, 18% garden waste and 5% builder's rubble. The budget for this collection service forms part of the operational budget of the resorts themselves.

3.5.2 Tariffs and billing

As discussed the Karwyderskraal Landfill is used by more than one municipality for the disposal of waste. The 3rd cell at the facility was developed by the Overstrand Municipality due to financial constraints in the ODM at the time. The development of Cell 4 is currently underway and the ODM will then take over the management and finances of the site from Overstrand.

Currently the Theewaterskloof Municipality and the Overstrand Municipality have a signed Service Level Agreement with the ODM, and pay for the use of the facility. The payment is made up of a Fixed Waste Disposal Cost, a variable Waste Disposal Tariff per ton of waste disposed and a Rehabilitation Contribution per ton of waste disposed. The details of the agreement and payment terms are described in the Service Level Agreement document that is available on the website of the ODM.

4. GAPS AND NEEDS ASSESSMENT

From the status quo evaluation the gaps and needs were identified and are discussed below. This section of the IWMP is aimed at identifying and analysing the waste management issues, problems, shortcomings and challengers that exist within the ODM, between the Status Quo and the desired state, and will be based on the objectives of the 2011 National Waste Management Strategy.

4.1 LEGISLATION

In terms of international, national and local municipal legislation, the legislation itself is not identified as a gap. By-laws of Overstrand and Cape Agulhas local municipalities will be amended during 2018 and the Theewaterskloof and Swellendam Municipalities need to review and amend their waste by-laws where required.

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Awareness of legislation is identified as a gap based on the apparent lack of legislative awareness by the generators of general, special and hazardous wastes. These wastes have either not been classified as per the Waste Classification Regulations by some of the generators or are not handled in compliant ways. Not all waste types and quantities are being reported as required. It appears that the generators and transporters are not fully aware of the national and local legislative requirements.

The non-compliances at municipal solid waste facilities are not specifically identified here as gaps, because the municipality is aware of these and regularly conduct external audits. The restriction in addressing these non-compliances in the short term is affordability which is discussed later.

Disposal facilities in the local municipalities 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 AND DISPOSAL QUANTITIES

Only the Gansbaai and Karwyderskraal landfill facilities have weighbridges where accurate record keeping of waste can take place. In order to make informed decisions on the required infrastructure within the ODM, the waste volumes requiring treatment needs to be known.

Waste generation quantities are difficult to calculate accurately since the waste collected by the municipality on kerbsides of residents and businesses are in many cases not the actual waste quantities that was generated. Some residents and businesses recover or recycle some of the waste they generate before putting the residual waste out for collection. Other residents and businesses discard all unused materials and packaging in which case the waste on kerb side contains much more recoverable materials in theory. Then there are the informal recyclers who in some residential areas go through the kerbside waste to remove potentially valuable items before the municipality collects the waste from kerb side.

What is possible to accurately measure is the tonnages and volumes of waste materials that end up at the final treatment (MRF, Composting and Landfill) facilities through installation of weighbridges etc.

4.3 WASTE MINIMISATION, RECYCLING AND RE-USE INITIATIVES

Waste minimisation must continually be promoted throughout the ODM. The ODM need to assist the local municipalities wherever possible with training and infrastructure required to divert waste away from landfills. Current needs from the local municipalities are for the development of material recovery facilities and composting site at landfills earmarked for closure.

Even with the successful recycling in some areas, the total diversion from landfill needs to be increased in order to achieve targets. With the volumes of garden waste in the generated waste stream, diversion options such as chipping and/or composting must be further explored where it is not currently done. The crushing of building rubble for alternative uses must also be explored.

Not all private recyclers report recycling statistics to the Local Municipalities. This needs to be addressed so that recycling statistics throughout the district can be determined and reported.

The continuation of waste minimisation through chipping of garden waste, use of builder's rubble as cover and recycling at MRFs should be encouraged. These activities are, at the moment, concentrated at the Karwyderskraal and Overstrand facilities and need to be expanded to the other municipalities within the ODM. The organic waste diversion plan being developed for the Karwyderskraal landfill needs to be implemented in order to further reduce organic waste to landfill.

4.4 AIRSPACE REQUIREMENTS AND LANDFILL OPERATIONS

The only landfill facilities within the whole of ODM where airspace is still available for disposal of waste is at the Bredasdorp landfill (Cape Agulhas Local Municipality) and the Karwyderskraal (Overberg District Municipality) landfill. The Bredasdorp Landfill, however, is experiencing challenges with compliant operation of the facility due to a lack of funding and manpower.

The Bontebok landfill (Swellendam Municipality) has theoretical airspace available through possible development of a new cell adjacent to the existing facility but this can only be realised after an amendment to their waste licenses which would require a full EIA and design and procurement process. The outcome

of a recently completed study on the feasibility of developing a regional landfill site for the shared use of the Swellendam and Cape Agulhas Municipalities will assist in addressing the need for airspace.

Airspace capacity within the ODM is, however, still identified as a need.

As mentioned the local municipalities do not feel as if they are in a position to properly manage the landfill facilities within their jurisdiction. They receive low audit scores and complaints from the public due to aesthetics and odours etc. There is thus a need for increase in landfill operating budgets for the local municipalities so that the facilities can be operated as sanitary landfills and not open dump sites as is the case in many instances.

4.5 INSTITUTIONAL AND ORGANISATIONAL NEEDS

The personnel required within the ODM to undertake all the mandated waste management requirements of a District Municipality is currently addressed / identified as a need. As discussed under section 3.4.1, the ODM plans to develop a position for a waste management official to assist the ODM waste management officer in his/her duties.

4.6 IDENTIFICATION OF ALTERNATIVES

As discussed, alternative options to the disposal of garden waste and building rubble must be sought to minimise disposal and improve diversion. This is very important in order to achieve the 20% diversion target by 2019, as this target will most likely not be reached by 2019 through recycling alone. These alternatives need to stretch beyond current treatment practices and need to include feasibility studies into the development of alternative and developing technologies.

The ODM need to assist the local municipalities in developing strategies to develop alternative waste treatment technologies where feasible. The method by which the ODM can best assist the local municipalities is to table these matters at the regional waste forum discussions. All the municipalities within the ODM form part of the regional waste forum and provides a platform for identification of alternative waste treatment options. The forum also provides the opportunity for the ODM to provide feedback to the local municipalities on the latest developments on alternatives provided by provincial and national government.

4.7 FUNDING MECHANISMS

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

Waste minimisation will require financial support and continual public awareness and education (which is on-going and very important) is also a continuous expense. The ODM cannot fund the waste management projects of the local municipalities, but they can assist by identifying the projects that require funding and by continuously applying for funding from national and international organisations.

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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.

Goal 1: Strengthened education, capacity and advocacy towards Integrated Waste Management							
Objectives		**2018**	**2019**	**2020**	**2021**	**2022 and on**	**Priority**
Strategic Objective 1:	Facilitate consumer and industry responsibility in integrated waste management	Maintain and improve upon the mandate of the Regional Waste Management Forum as per the adopted ODM Environmental Management Policy. Assist the local municipalities with establishment and oversight of waste management education and awareness campaigns by discussing it at the regional waste forum.					High
Strategic Objective 2:	Promote and ensure awareness and education of integrated waste management						
Strategic Objective 3:	Build and strengthen waste management capacity	Overberg District 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 environmental management department employees are informed regarding the latest legislation and how to appropriately handle and identify various waste types. The South African Institute of Waste Management (www.iwmsa.co.za) is a voluntary organization that provides training on the management of waste. The ODM is encouraged to have their staff become members of this institute and to attend the training sessions that is available on their website.					
	Costs & Human Resources	Costs to be determined (OPEX). One to two persons in the municipality required, or a consultant can be appointed for public awareness and education or by means of partnerships with other departments. Additional costs are dependent on the number of employees attending educational and capacity building events.					

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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 3rd Generation IWMP and develop Organic waste Diversion Plan	Review IWMP and submit IWMP annual report.	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	R500 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 of the local municipalities need to 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. The role of the district is to support the local municipalities where possible to ensure accurate information transfer to industry.					High
Strategic Objective 3:	Promote the establishment of integrated waste management infrastructure and services	Ensure that infrastructure at Karwyderskraal is sufficient to cater for waste treatment and disposal needs of all municipalities and private clients that use the facility. This includes development of Cell 4 and expansion of composting facility if required. Ensure that Karwyderskraal landfill is operated in accordance with the licence conditions. Assist local municipalities with development of Waste Characterisation Studies and ensure that WCS is done as part of the operations contract at the KWK landfill or as part of the long term planning where all the municipalities use district landfill sites. Ensure that the capturing of waste information will be recorded by local municipalities at transfer stations. Develop/Implement recommendations of the Karwyderskraal Organic Waste Diversion Plan.					High
	Costs & Human Resources	R25 Million. Appointed Consultant and Contractor for Cell 4 development at Karwyderskraal Landfill					
	Promote the establishment of integrated waste management infrastructure and services	Fill all possible vacant positions within the ODM waste management structure to keep up with growth and service needs.					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	Record and follow up on decisions taken at District Waste Forum Discussions. The ODM is to take ownership of forum management and following up with the local municipalities on which projects or processes have been completed or still requires attention. Provide opportunities for developing small and micro enterprises in the waste management space by discussing possible phased projects at the regional waste forum.	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	Remuneration for contractors/service providers to operate and maintain the KWK landfill	Appoint new contractors/service providers for operation of the landfill site and ensure tender conditions allow for maximum use of local labour to increase job opportunities in the area.				High
Strategic Objective 3:	Increase waste diversion through reuse, recovery and recycling	Enable diversion potential through discussion at waste forum. In this way the ODM can support local municipalities with development of MRF and composting facilities and assist with procurement of associated infrastructure and equipment like chippers, weighbridges etc. Decisions taken at the waste forum can also assist local municipalities with strategies for undertaking waste characterisation studies. The ODM can also increase diversion by undertaking regular waste characterisation studies at the Karwyderskraal Landfill.					High
	Increase waste diversion through reuse, recovery and recycling	Participate in the outcomes of the study into the possible development of a regional landfill for Swellendam and Cape Agulhas. Update the ODM Waste Disposal Strategy document.					
	Costs & Human Resources	To be determined after decision on regional site for Cape Agulhas and Swellendam.		TBD	TBD		

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 Karwyderskraal Landfill as required according to licence 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. Costs TBD.					
	Strengthen compliance monitoring and enforcement	Cooperate with the local municipalities, public and law enforcement to reduce instances of illegal dumping.					
Strategic Objective 2:	Remediate and rehabilitate contaminated land	Use the regional waste forum to assist local municipalities to develop and obtain approved closure and rehabilitation designs for sites issued with closure licences. Monitor the progress of landfill rehabilitations through continuous discussion.					Medium
	Costs & Human Resources	TBD					
Strategic Objective 3:	Facilitate the development of waste policy instruments	Develop and maintain waste disposal strategies (and this IWMP) in consultation with local municipalities.					Low
	Costs & Human Resources	Solid waste manager and his appointed consultants.					
Strategic Objective 4:	Promote self/co-regulatory measures	Ties in with Goal 1. Person responsible to assist local municipalities to liaise with industry, should promote the implementation of these measure e.g. through reviewing industry waste management plans where applicable.					Medium

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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:

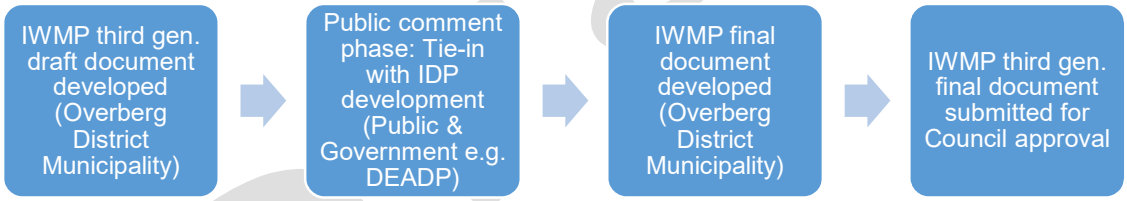
- The ODM Waste Management Officer (Mr. Francois Kotze)
- The ODM Director Community Services
- The ODMs appointed consultant, but only if required.

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 Overberg District 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 third 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 Manager: Environmental Management Services, 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 ODM will report on the following in its Annual Report.

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. 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 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.

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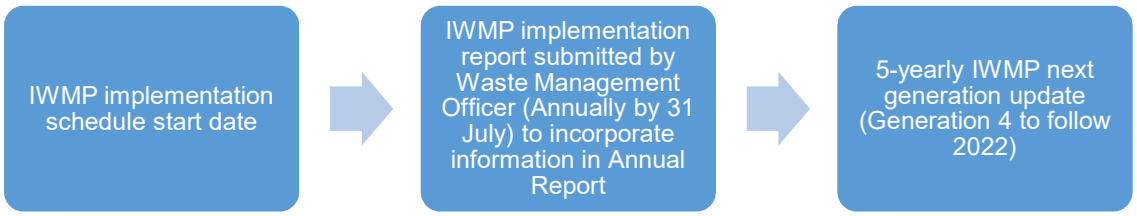


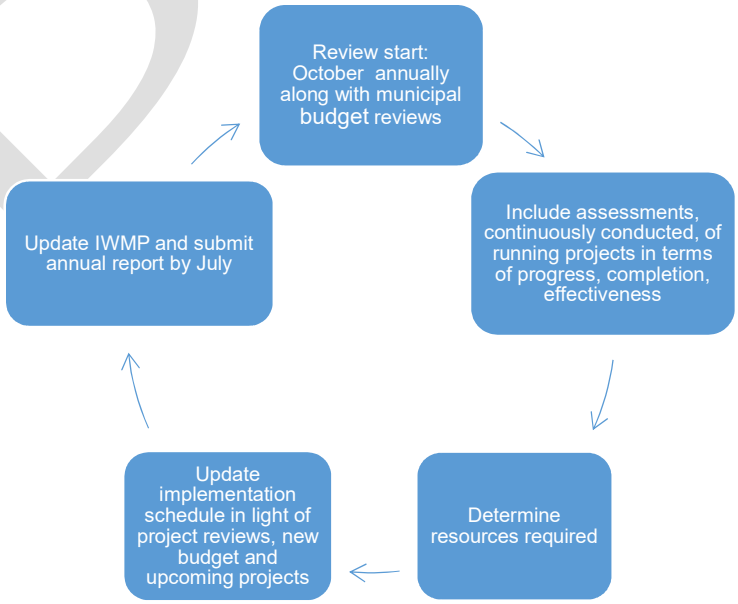
The annual implementation reports will be submitted by the Overberg Municipality and will be compiled by Manager: Environmental Management Services, or to whom the task is delegated by him. The annual report must contain the approved implementation items and dates of the IWMP and the progress thereof 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 ODM 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:



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6.3 KEY PERFORMANCE INDICATORS

The ODM sets Key Performance Indicators (KPI's) that need to be continually achieved by the Environmental Management department relating to solid waste and service delivery. These KPI's are detailed in the table below:

Table 6-1: Key Performance Indicators

Performance Objective	KPI	Target	Target Description
Annually Review IWMP	By May annually	1	1 review per annum
Input to Annual Report	Annually by July	1	Inputs submitted
Construction of Cell 4 - Karwyderskraal	Cell 4 Constructed by June 2019	1	Cell 4 completed
Regional Waste Management Forums	Quarterly RWMF held per annum	4	1 Meeting per quarter
Establish an IWMP monitoring advisory committee	Established by February 2019	1	IWMP monitoring committee established
Appoint Service provider to Manage KWK	Appoint service provider to manage Karwyderskraal Landfill site by March 2019	1	Appointment of service provider
Internal Compliance Audits on waste facilities	Quarterly Audits	8	1 per quarter per facility
Karwyderskraal monitoring committee	Annual monitoring meeting	1	1 per annum
SLA with user Municipalities	Annual Revision of SLA by November	1	1 meeting per annum
IWMP action plan with timeframe	Compile an Action plan by July 2018	1	

KPI's will be reviewed with the revision of the plan

Apart from these KPI's set by the Municipality, the implementation items of section 5 will also serve as performance indicators as they will be reviewed and reported on to keep the IWMP up to date.

7. CONCLUSIONS AND RECOMMENDATIONS

Through this 3rd generation IWMP development, the current solid waste management system of the Overberg District Municipality has been assessed in order to determine the adequacy, shortcomings and possible improvements.

The ODM needs to ensure development of the new cell at the Karwyderskraal Landfill for disposal purposes and maintain current good operations. Planning needs to be done for eventual closure and rehabilitation and improved data capturing. Waste diversion needs to be maintained and increased in order to meet diversion targets. This needs to be done through focusing on the local municipalities with the most need and maintaining the good work done by other municipalities.

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 integrated waste management objectives of Overberg Municipality can be summarised as follows:

- To ensure that Waste Management in the Overberg 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 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, or goals, are aligned with the Provincial Integrated Waste Management Plan by DEADP as per 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 the Overberg 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).

The ODM can only act in accordance with the functions and powers given to them by law, specifically the Municipal Structures Act (Act 117 of 1998). This includes only being responsible for waste management infrastructure where said infrastructure serves more than one local municipality.

Legislation & Compliance

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

Municipal waste management facilities must be audited for compliance. The municipality in question 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 and that the funding opportunities and shortcomings are continuously discussed at the regional waste forum.

Waste Quantities & Data

Data collection in terms of solid waste types and quantities needs to improve throughout the District. It is recommended that generators of hazardous waste register and report to the municipality. Information from private recyclers also need to be obtained and updated. Through discussions at the regional waste forum the ODM need to assist the local municipalities wherever possible to develop waste characterisations strategies which are in line with the guidelines established by the DEADP.

Waste Collection, Transfer and Transport

A decision needs to be taken on the future waste disposal needs of the Swellendam and Cape Agulhas Municipalities based on the outcomes of the feasibility study into the possible development of a regional landfill site to serve these areas. The development of transfer infrastructure linked to the chosen option then needs to be planned and executed in a sustainable manner.

Waste diversion

Waste diversion must improve in order to meet diversion targets in all local municipalities within the District. Recycling currently has a minimal impact on the waste stream. Diversion of organic waste from the Karwyderskraal landfill needs to be investigated through the development of an Organic Waste Diversion Plan.

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It is lastly recommended to start with the implementation of the 3rd generation Overberg IWMP as soon as it is approved by Council and be included as a sectorial plan of the Overberg IDP. It must be regularly reviewed as per the recommended review programmes and updated as necessary.

8. REFERENCES

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- JPCE (Pty) Ltd (February 2015). Draft 3rd Generation Integrated Waste Management Plan of the Theewaterskloof Local Municipality.
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- Worley Parsons (June 2012). Final 2nd Generation Integrated Waste Management Plan for the Overberg District Municipality
- Western Cape Government. Green is Smart; Western Cape Green Economy Strategy Framework 2013
- Western Cape Government. Provincial Strategic Plan 2014 – 2019.
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ANNEXURE A

DEADP INTEGRATED WASTE MANAGEMENT PLANNING CHECKLIST (2015/16)

ANNEXURE B

REPORT ON THE ASSESSMENT OF THE 2ND GENERATION INTEGRATED WASTE MANAGEMENT PLAN OF THE OVERBERG DISTRICT MUNICIPALITY (NOVEMBER 2012)

Draft

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CLIENT:	PROJECT:
OVERBERG DISTRICT MUNICIPALITY	INTEGRATED WASTE MANAGEMENT PLAN

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