OVERSTRAND MUNICIPALITY

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OVERSTRAND

INTEGRATED WASTE MANAGEMENT PLAN

(Third Edition - Draft)

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Compiled by:

JPCE

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Abbreviations

AACL	Animal Anti-cruelty league
ACDASA	Agricultural Crop Protection Dealers Association of South Africa
AVCASA	Association of Crop Protection and Animal Health Associations of South Africa
CNC	Cape Nature Conservation
COD	Chemical Oxygen Demand in mg/ℓ
DEAT	Department of Environment Affairs & Tourism
DEA&DP	Western Cape Provincial Department of Environmental Affairs and Development Planning
DWAF	Department of Water Affairs & Forestry
EH	Environmental Health
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
Haz	Hazardous
HCGW	Health Care General Waste
HEALTH CARE RISK WASTE	Health Care Risk Waste
HCW	Health Care Waste
HDPE	High Density Polyethylene
JPCE	Jan Palm Consulting Engineers
kg	kilogram
kℓ	kilolitre
ℓ	litre
LDV	Light Delivery Vehicle
m^3pa	cubic meter per annum
NOPT	No Pre-treatment
PT	Pre Treatment
SOG	Soap, Oil and grease in mg/ℓ
tpa	ton per annum
VWMF	Vissershok Waste Management Facility
WWT	Waste Water Treatment
OM	Overstrand Municipality
ODM	Overberg District Municipality
BCL	HEALTH CARE RISK WASTE Contractor in Cape Town

Standards used in Plan:

- 1 kg = 1ℓ
- 1 kℓ = 1 m³ = 1 tonne
- Weight of 1 laser ink cartridge = ca 500 g
- Weight of 1 empty 500 mℓ oil tin = ca 86 g
- Weight of 1 empty 5 ℓ paint tin = ca 500 g
- Weight of 1 empty 20 ℓ plastic drum = ca 1 kg
- Weight of 1 general car tyre = ca 5 kg (to 10 kg)

OVERSTRAND MUNICIPALITY

INTEGRATED WASTE MANAGEMENT PLAN

EXECUTIVE SUMMARY

GENERAL DESCRIPTION

The third version of the Integrated Waste Management Plan (IWMP) has been formulated by JPCE on behalf of Overstrand Municipality to address the challenge of waste management in Overstrand, home to some 85 000 people. The IWMP is a statutory requirement of the new 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.

Overstrand Municipality is located along the south western coastline of the Overberg District Municipal area bordering the City of Cape Town in the west and Cape Agulhas Municipality in the east. Its northern neighbour is Theewaterskloof Municipality.

The area is noted for its floral kingdom as well as whale-watching.

The Overstrand Municipality was established in terms of Provincial Notice 494/2000 published in Provincial Gazette 5591 (Western Cape) dated 22 September 2000. It is an amalgamation of the areas of the earlier municipalities of Hangklip-Kleinmond, Greater Hermanus, Stanford and Greater Gansbaai.

POLICY AND LEGISLATION

Existing legislation on waste management in South Africa is generally fragmented, diverse and ineffectively administered. The environment is a cross-sectional matter and it is therefore important that co-operation between government of all levels is necessary.

The Constitution of South Africa (Act 109 of 1996) protects everyone's right to an environment that is not harmful to a person's health and well-being. Furthermore, the constitution also describes the role and responsibilities of Local Government which involve the objectives in Section 152, namely:

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

The Constitution further stipulates under the powers and functions of Municipalities, specifically Part B of Schedule 5 relating to Solid Waste Management:

- Refuse removal
- Refuse dumps
- Solid waste disposal

The Waste Act prescribes the following responsibilities to Municipalities:

- 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;
- ensuring that people are aware of the impacts of waste on health and the enivronment.

The Plan also stipulated the various applicable sections of the National Environmental Management Act, National Water Act, Atmospheric Pollution Prevention Act, National Waste Management Strategy and the Waste Act.

It is recommended that the Overstrand's By-laws are updated to include the new content of the Waste Act.

EXISTING WASTE MANAGEMENT

METHODOLOGY AND CURRENT STATUS

The methodology of General Waste data collection is based on actual weighbridge data received from the Overstrand Municipality. Weighbridge data since April 2010 is available.

However, information on specific waste streams such as electronic waste, used tyres, batteries, etc are generally not recorded.

WASTE AVOIDANCE

Currently waste avoidance is not being practiced to any significance.

COLLECTION

The different levels of collection service are currently being investigated and the whole of the Municipality will receive weekly collection from 1 July 2012.

All towns located in the Overstrand service areas also receive a weekly collection service for source-separated recyclables.

WASTE REDUCTION

Waste reduction in Overstrand is currently practised by participating residents and a small number of private companies of which Walker Bay Recycling is the most prominent.

Material recovery also takes place at the Hermanus Transfer Station and Gansbaai MRF. The collected recovery data from these facilities with the inclusion of Walker Bay Recycling's efforts show that currently 6% of the total generated waste stream is being recovered for recycling. The chipping of garden waste contributes to a further 11% diversion from landfill.

WASTE DISPOSAL

Disposal of municipal solid waste in Overstrand is practiced at the Gansbaai Landfill, as the existing cells at the regional Karwyderskraal Landfill have reached capacity. Karwyderskraal will receive waste again when the construction of cell 3 is completed. A number of closed waste sites are still to be rehabilitated when sufficient capital has been sourced and allocated.

Public Drop-off facilities have to date been provided in Hawston/Fishershaven (S34 22 38.36 E19 07 41.00), Voëlklip (S34 24 44.9 E19 18 20.7), Stanford (S34 26 50.41 E 19 27 23.59), Pearly Beach (S34 39 53.20 E19 30 12.84) and Kleinmond (S 34 20 11.96 E19 00 16.31). All these facilities are equipped with $30m^3$ skips. These facilities provide the residents the convenient opportunity to dispose waste that they have not put out for collection, into containers for later removal by the municipality or its agent.

At Rooi-Els (S34 18 06.8 E18 49 10.3), Pringle Bay (S34 20 33.6 E18 50 38.5) and Betty's Bay (S34 21 20.7 E18 51 44.5) Public Drop-off facilities are provided in the form of caged trailers.

COSTS OF EXISTING WASTE MANAGEMENT

The 2010/11 financial year indicates a waste management operating cost of R36,728,654 against an operating income of R37,234,513. The estimated 2011/2012 costs are budgeted at R39,528,427 against an estimated R40,454,000 income.

STAFF RESOURCES

The Cleansing Department of Overstrand currently has only one vacant post.

Although municipal waste management in the Overstrand appears to be well managed, the main focus still appears to be collection and disposal, rather than waste avoidance and waste reduction. Although Overstrand Municipality has taken a leading role in the country with regard to source separation of recyclable materials, the participation rate is low and the resulting success rate with source separation also low.

This Plan has as its goal the transformation of the current waste management system towards a system whereby an atmosphere is created that will conserve and protect the environment and natural resources. An outcome of this Plan will be the development of a communication/information/education strategy that will help to ensure public acceptance or ownership of the strategic objectives and to promote co-operative community action. The Plan will also provide a framework to address the municipality's growing waste management problem in accordance with the best prevailing norms, financial capacity and best environmental practice.

Finally the Plan will also attempt to address the three main objectives of the National Waste Management Strategy, i.e. waste avoidance, waste reduction and waste disposal. With the Waste Act coming into effect on 1 July 2009, every Municipality is now responsible, by law, to minimise waste volumes. Where waste reduction or minimisation has never been a municipal function, through the Waste Act, it now is.

To achieve the above, this Plan aims to ensure that waste management in the Overstrand 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.

In short, this implies that it is the aim of the Overstrand Municipality to minimise the entrance of material into the waste stream and to reduce all waste of which the generation cannot be avoided so that no material of value or anything that can decompose, gets disposed. Furthermore will it be the aim of Overstrand Municipality to dispose the waste that cannot be avoided or reduced, at licensed facilities in accordance with regulatory requirements and with regular operational and environmental monitoring. The Overstrand Municipality therefore accepts its legal obligation regarding waste management.

IMPLEMENTATION INSTRUMENTS

Waste Avoidance is the primary focus of the National Waste Management Strategy and as such must be the priority of any Integrated Waste Management Plan. Waste Avoidance is defined as the action that avoids the entry of material into the waste stream that is when the generator of the potentially waste material exercises the decision to do something else with that material rather than to put it out for waste collection. The following are examples of waste avoidance:

- Composting of the organic/green waste at home
- Self-delivery of glass/cardboard/newspaper/PET to recycling bins or school recycling projects
- Re-use of empty jars as storage containers at home
- Reclamation of drum containers
- Recovery of fruit and food solid waste component as animal feed
- Recovery of chemicals (such as caustic soda) from industries
- Recovery of electronic equipment
- Changing raw materials of industrial processes to produce recoverable industrial waste

From the above it is clear that waste avoidance will result not only in less material to be disposed but also in less material to be collected by the waste collection system.

The following are Overstrand Municipality's plans for the promotion of waste avoidance in its area:

- The creation of Public Awareness and Education,
- Prevention Quantification through the setting of goals.

Waste Reduction will be achieved through the recovery and/or composting of waste after collection. For this purpose the municipality will establish strategically located material recovery facilities and composting facilities (Hermanus and Gansbaai already have a MRF each), or fully support existing infrastructure, in order to reduce the volume of waste destined for landfilling. In order to make waste reduction sustainable, the quality of the recovered material must be as uncontaminated as possible and to ensure this, the Municipality will expand the current source separation initiative.

The Municipality will also expand on its current practice to provide the public the opportunity to separate their household hazardous wastes, electronic wastes and household healthcare wastes and delivered it to waste facilities for safe disposal or treatment at other facilities in order to divert these special wastes from the General Waste landfills.

Sustainable waste disposal, although it is considered to be the least desirable option in the waste hierarchy, will be achieved through properly engineered waste disposal facilities and the frequent monitoring thereof. The

municipality is currently operating a licensed waste disposal site near Gansbaai and will make use again of the regional licensed landfill at Karwyderskraal when cell 3 has been completed. Continuous extension of these facilities within sufficient time-frames will be required to maintain sufficient airspace for waste disposal. Even though the main focus of waste management must shift towards waste minimisation and the reduction of waste that requires disposal, waste disposal will still be required. The closed small waste disposal sites near the smaller towns shall also be rehabilitated within the next five years.

Other waste management objectives to be met by the municipality are a review of its waste collection service to ensure an affordable and similar service to all, a proper waste data collection and capturing system and an appropriate waste cleansing system. The waste collection service is currently under review.

Since the Integrated Waste Management Plan as specified and required by the National Waste Management Strategy (and the Waste Act) is a strategic framework, the implementation of its instruments is flexible and will require regular re-evaluation and modification, as required.

In order to accommodate the municipal budgeting process, it would be appropriate to implement the instruments over a number of financial years, focussing on the critical aspects first.

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INTEGRATED WASTE MANAGEMENT PLAN

1. PREFACE

1.1 INTRODUCTION

An Integrated Waste Management Plan of Overstrand Municipality was developed by the municipality and submitted to the Department of Environmental Affairs and Development Planning in January 2006. An Assessment Report of the Draft IWMP was compiled by the Directorate: Pollution and Waste Management of DEA&DP and was submitted to the municipality in January 2008, reflecting the assessment of the IWMP against a guideline and checklist developed by the Directorate.

The Department of Environmental Affairs and Tourism published a document: *Starter Document for Integrated Waste Management Planning in South Africa - Guideline Document - Final Draft - May 2000* listing what the contents of an IWMP should be. A second version IWMP was submitted by JPCE in October 2009 which followed that guideline.

This document is the 2012 update of the Overstrand IWMP Second Edition and forms the Third Edition.

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 Overstrand Municipality.

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

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

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

1.2 GENERAL DESCRIPTION

Overstrand Municipality is located along the south western coastline of the Overberg District Municipal area bordering the City of Cape Town in the west and Cape Agulhas Municipality in the east. Its northern neighbour is Theewaterskloof Municipality.

The area is noted for its floral kingdom as well as whale-watching.

The Overstrand Municipality was established in terms of Provincial Notice 494/2000 published in Provincial Gazette 5591 (Western Cape) dated 22 September 2000. It is an amalgamation of the areas of the earlier municipalities of Hangklip-Kleinmond, Greater Hermanus, Stanford and Greater Gansbaai.

Refer to Figure 1-1 for a Plan of the Study Area.

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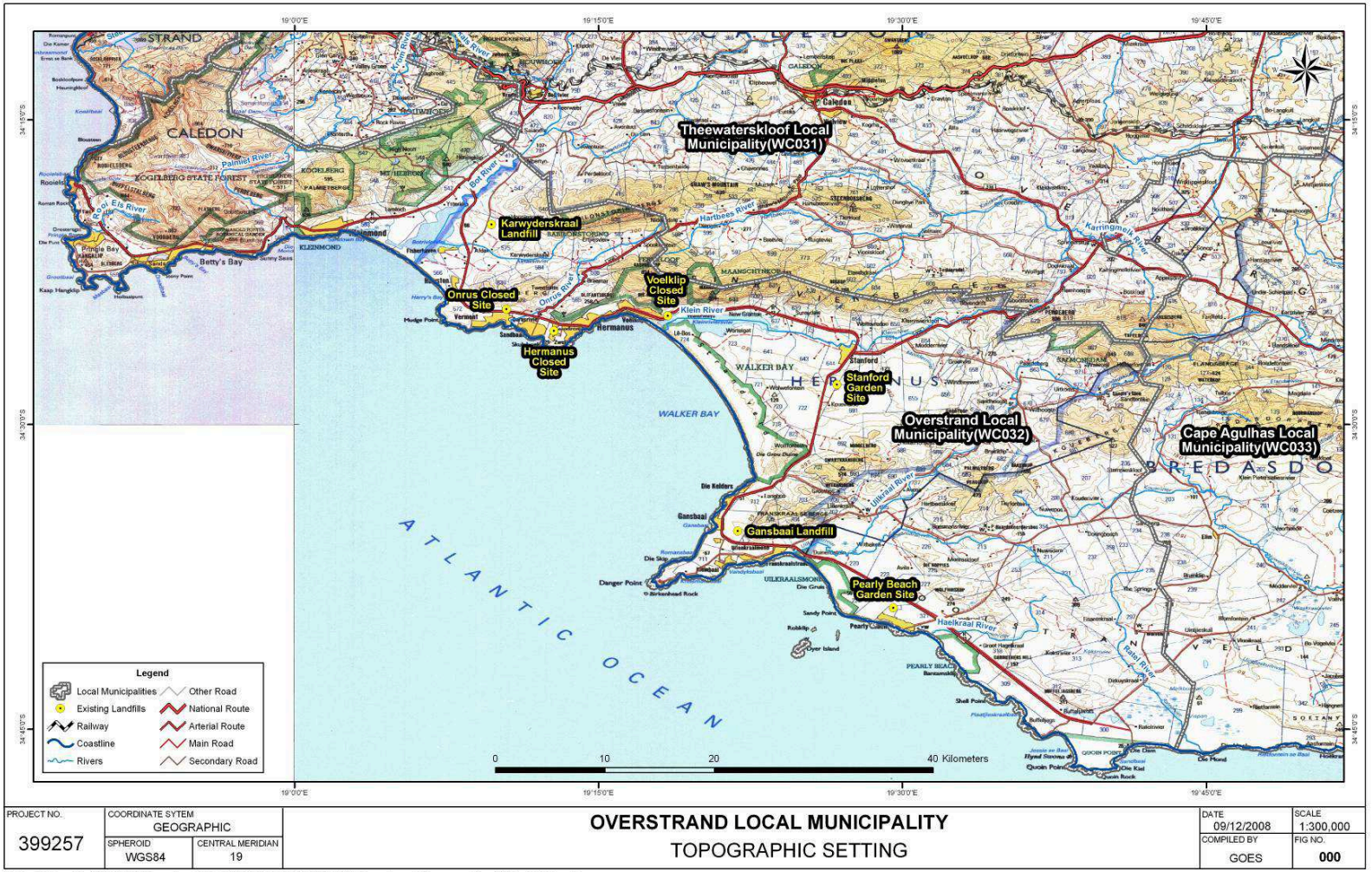

Figure 1-1: Study Area - Overstrand Municipal Area

1.2.1 Geology and Hydrogeology

1.2.1.1 Geology

(Refer Figure 1-2)

The Overstrand Municipal area is underlain by rocks of five main geological formations which are, in chronological order, the Malmesbury, Table Mountain, Bokkeveld and Bredasdorp Groups. The Malmesbury Group rocks are intruded by granites of the Hermanus Pluton.

The Malmesbury Group rocks occupy relatively small areas in the Papiesvlei and Ratel River areas. These rocks are very old, >600 million years, and comprise metasediments such as phyllitic shale characterized by clayey soils. They are intruded by granites of the Cape Granite Suite, which form the Hermanus Pluton. Outcrops are limited to a small fault bounded area inland of Onrus and granites are also known to occur south-east of Pearly Beach.

The Table Mountain Group (TMG) rocks occupy the mountainous topography forming the bulk of the Pringle Bay-Hermanus-Stanford area, a “V” shaped area between Danger Point and Oukraal/Elim and the catchments of the Haelkraal and Ratel Rivers. Two main formations are present, the lower Peninsula Formation and upper Nardouw Subgroup. They predominantly comprise resistant quartzitic sandstones separated by the Cederberg Shale Formation. This forms a prominent marker horizon characterized by a smooth green band amongst the otherwise greyish craggy outcrops of quartzitic sandstones.

The Bokkeveld Group consists of alternating shale and subordinate sandstone beds limited to the area between Baardskeerdersbos and Elim, and east of Stanford. It is characterized by clayey soils.

The Bredasdorp Group occupies the coastal plain area between the TMG Mountains and the coast and is characterized by wind-blown sand, calc-arenite and calcrete deposits. They are most extensive in the Walker Bay area where they reach thicknesses of over 100 m. They infill palaeochannels in the underlying TMG rocks with coarse sediments that give rise to springs, particularly in the Gansbaai area, e.g. De Kelders.

Alluvial deposits comprising sand, gravel and clay occur in mostly narrow belts following the main rivers, particularly the Uilkraal River.

A number of regional fault systems cut the area with the main trend being ENE-WSW.

1.2.1.2 Groundwater

(Refer to **Figure 1-3** and **Figure 1-4**)

In broad terms, any aquifers developed in rocks of the Malmesbury, Table Mountain and Bokkeveld Groups will be of the fractured or secondary type, which are shown as shades of green on Figure 1-3. Aquifers developed in the unconsolidated Bredasdorp Group and alluvial deposits will be of the intergranular or primary type and are coloured shades of mauve on Figure 1-3. Aquifers developed in the granites can be of the fractured and intergranular type (weathered zone) and are coloured light red on Figure 1-3.

The towns of Hermanus, Gansbaai, Kleinmond, Pearly Beach, Buffeljags and Stanford all derive part of their water supplies from groundwater sources and as such is it crucial that the Municipality prevent any groundwater contamination by regularly monitoring groundwater quality at the landfill sites.

The Malmesbury and Bokkeveld Group rocks are of generally low potential in the area. The TMG Aquifers have good potential and are recognized as one of the best aquifers in South Africa, but are often inaccessible due to the rugged mountainous topography developed on the resistant quartzitic sandstones. The best potential in this aquifer is found in the coastal plain area around Hermanus and the Kleinmond area. In the former area the Gateway Wellfield has been developed for supply to Hermanus from deep (>150 m) boreholes. Further exploratory drilling is taking place in this aquifer in the Hemel-en-Aarde Valley for further supply to Hermanus and also inter alia for the towns of Baardskeerdersbos and Buffeljags.

Gansbaai derives part of its water supply from springs emanating from palaeochannels in the TMG bedrock, e.g. at De Kelders and Stanford's Cove on the coast just to the north-east of the town. Springs of a different origin also supply Pearly Beach.

Groundwater circulation in the TMG Aquifer is generally deep-seated and it has been postulated that the major fault zones act as conduits for groundwater flow from the inland mountainous recharge areas to the coast.

The Walker Bay primary aquifer is largely undeveloped and un-characterized but could have good potential given its thickness and storage capacity. This aquifer is tapped to some extent for supply to Stanford with a perennial spring located just outside of the town near the road to Gansbaai.

In terms of groundwater quality (Figure 1-4), most of the area has good to moderate quality groundwater, with electrical conductivity of <70 mS/m in the TMG Aquifer and 70 to 300 mS/m in the Walker Bay and Pearly Beach-Haelkraal-Ratel River areas.

Eskom has identified a site about 5 km to the south-east of Pearly Beach, Bantamsklip, as being potentially suitable for establishment of a nuclear power plant and investigations are underway to determine the suitability of the site from an engineering and EIA perspective. Groundwater occurrence at this site has been shown to be minimal and of poor potential.

1.2.2 Hydrology

The Overstrand municipal area has a number of rivers flowing from the northern mountain range towards the coast. Most prominent of these are the Bot River, Klein River and Uilkraal River. All three of these rivers open up into lagoons before discharging into the ocean.

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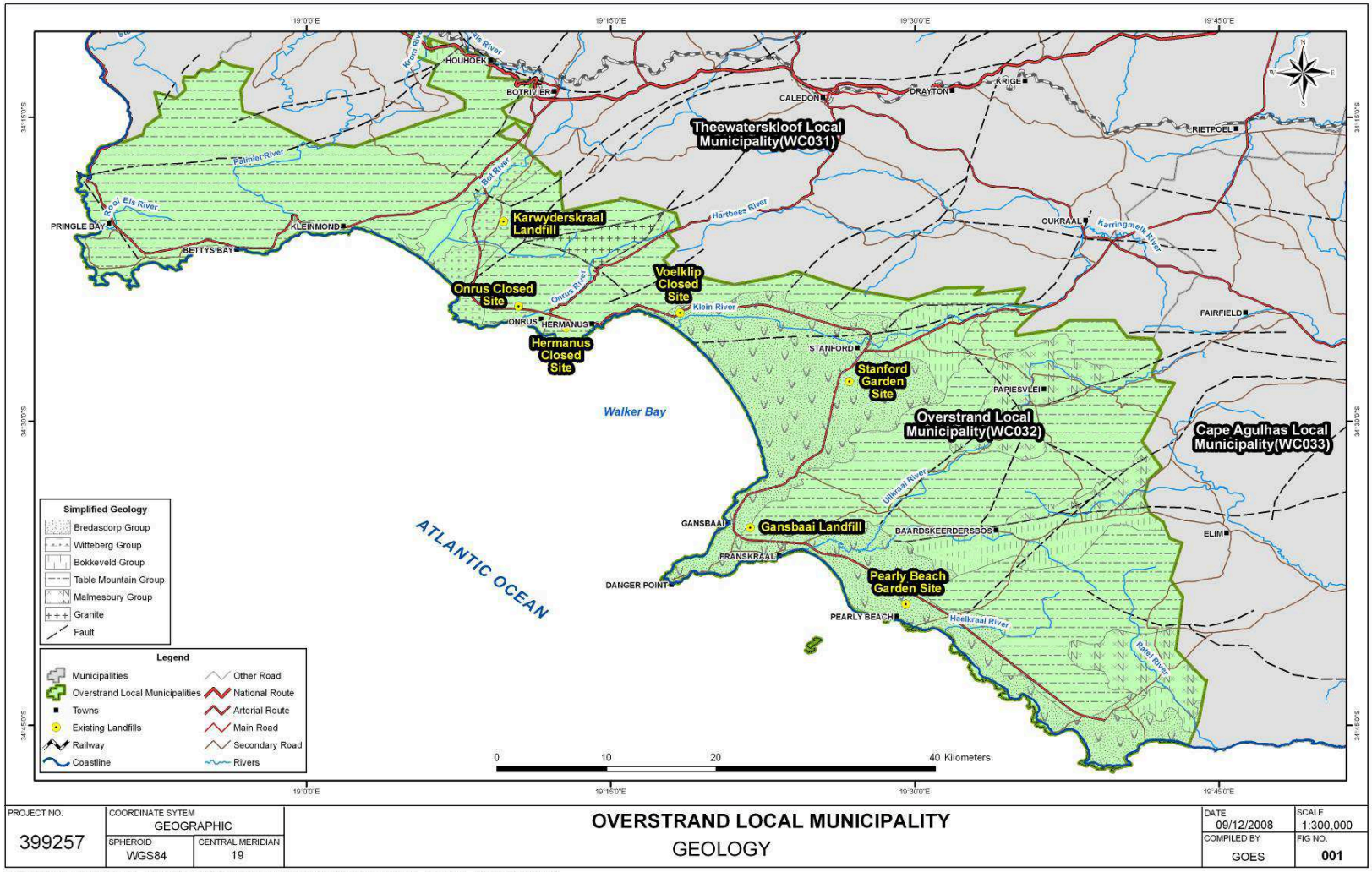

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Figure 1-2: Geology of Overstrand Municipal Area

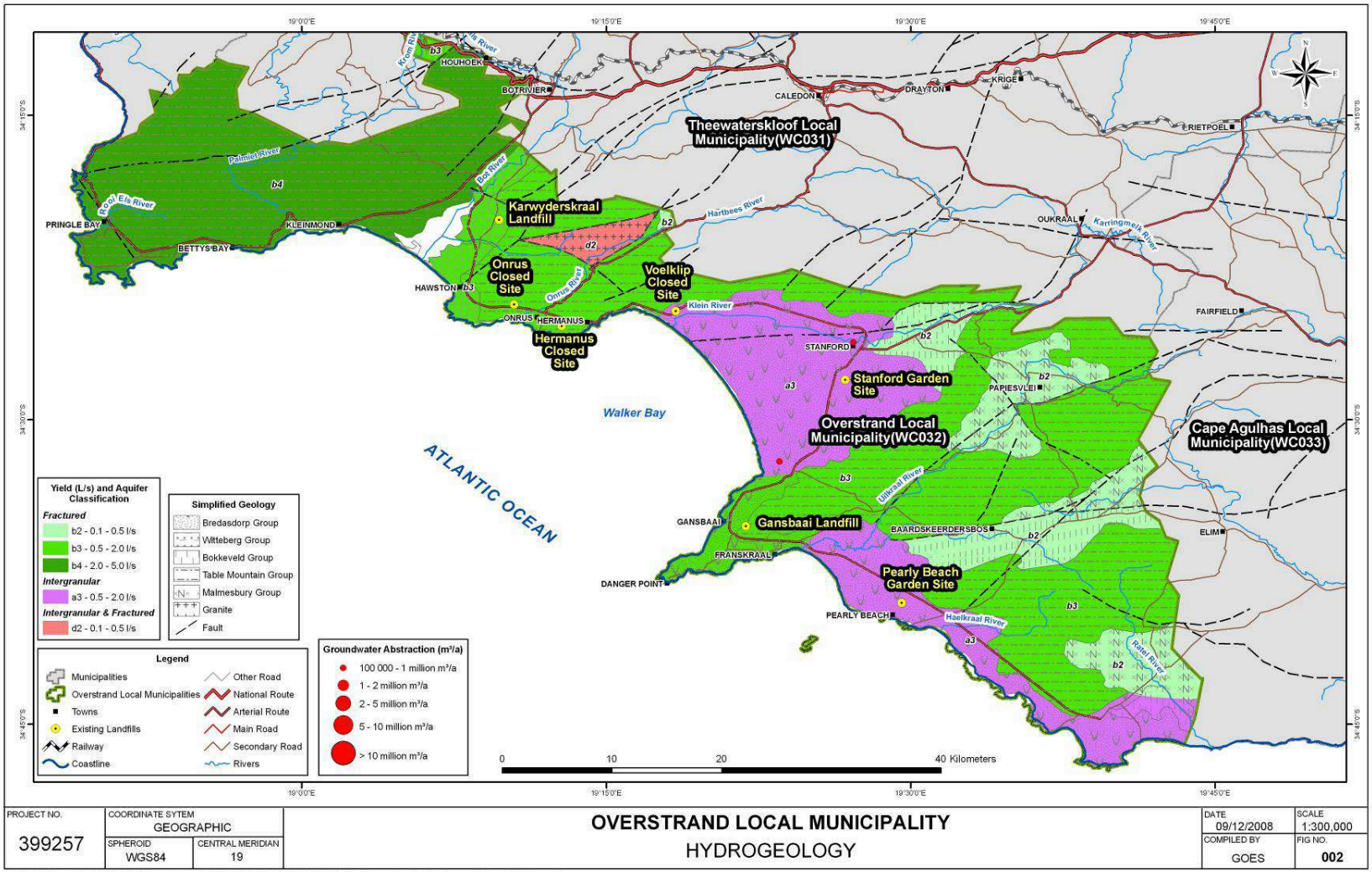

Figure 1-3: Hydrogeology of Overstrand Municipal Area

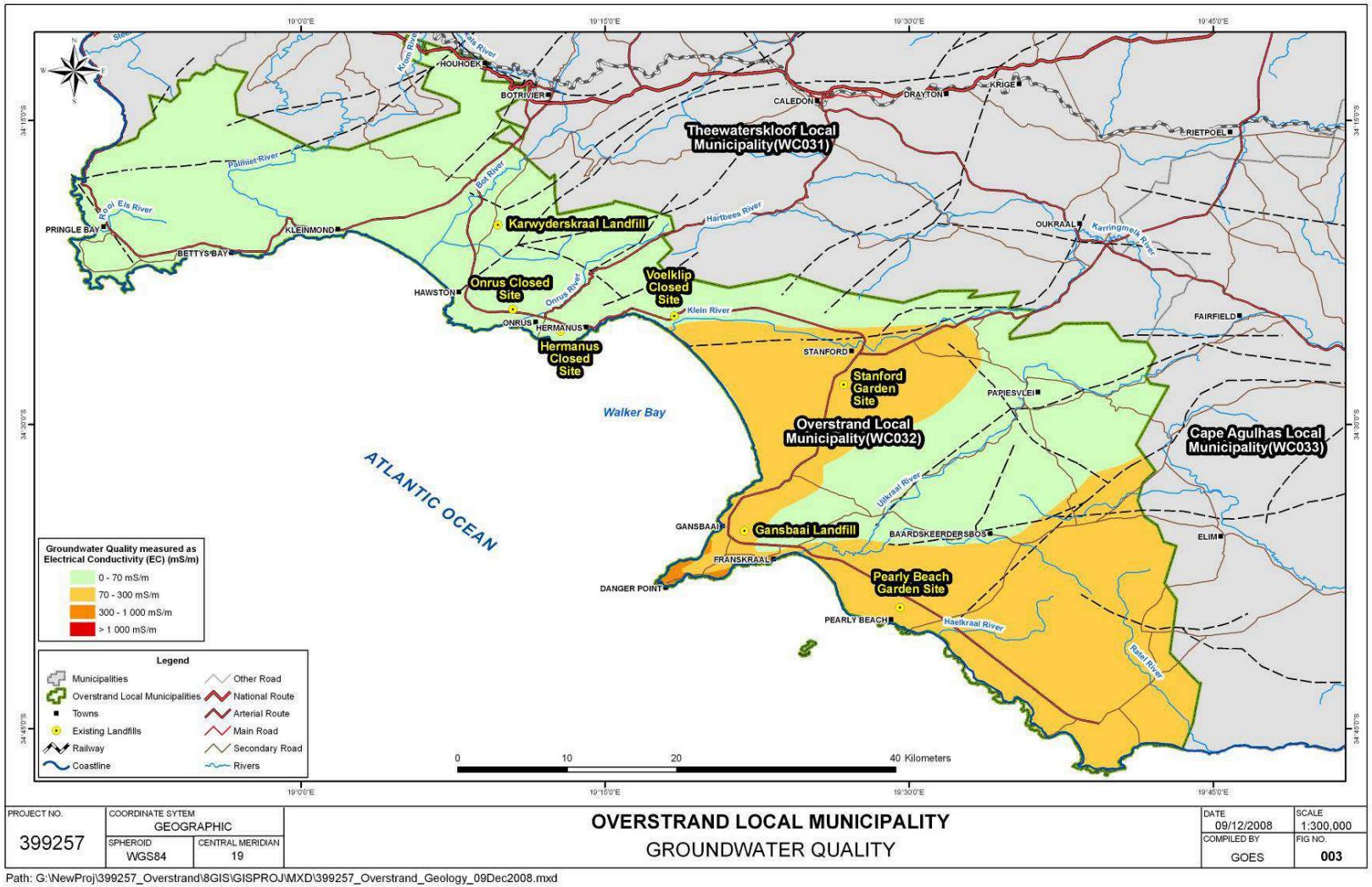

Figure 1-4: Groundwater Quality of the Overstrand Municipality

1.3 DEMOGRAPHICS

The statistics relating to population were taken from Statistics SA's 2001 Census figures. The total population of Overstrand Municipality, according to the 2001 Census, was 55,373. The figures have been adjusted with the expected growth rate of 3.7% (taken from the IDP) to indicate the current and future population figures. These figures are displayed in Table 1-1.

Table 1-1: Population Figures

Town	Sub-area	2001	2007	2010	2012	2015	2020
Betty's Bay	-	188	247	278	298	333	399
Betty's Bay	Klipkop	71	93	105	113	126	151
Betty's Bay	Sunny Seas Estates	94	123	139	149	166	200
Danger Point	Birkenhead	33	43	49	52	58	70
Eluxolweni	-	288	378	425	457	510	611
Fisherhaven	Lake Marina	475	623	701	754	841	1 008
Franskraalstrand	-	889	1 166	1 312	1 411	1 574	1 887
Gansbaai	-	903	1 185	1 333	1 433	1 599	1 917
Gansbaai	Blompark	1 430	1 876	2 111	2 270	2 532	3 036
Gansbaai	Die Kelders	951	1 248	1 404	1 510	1 684	2 019
Gansbaai	Gansbaai	334	438	493	530	591	709
Gansbaai	Groenewaldskema	736	966	1 086	1 168	1 303	1 562
Gansbaai	Perlemoenbaai	296	388	437	470	524	628
Hawston	-	6 618	8 683	9 770	10 506	11 716	14 050
Hermanus	-	3 091	4 055	4 563	4 907	5 472	6 562
Hermanus	Mount Pleasant	5 991	7 860	8 844	9 511	10 606	12 719
Hermanus	Voelklip	960	1 260	1 417	1 524	1 699	2 038
Highlands State Forest	-	57	75	84	90	101	121
Kleinbaai	-	213	279	314	338	377	452
Kleinmond	-	5 046	6 620	7 449	8 010	8 933	10 712
Kleinmond	Protea	1 185	1 555	1 749	1 881	2 098	2 516
Kogelberg State Forest	-	53	70	78	84	94	113
Masakhane	-	2 014	2 642	2 973	3 197	3 565	4 276
Onrusrivier	-	2 127	2 791	3 140	3 377	3 765	4 516
Onrusrivier	Vermont	1 340	1 758	1 978	2 127	2 372	2 845
Overstrand	Rural	1 732	2 272	2 557	2 750	3 066	3 677
Overstrand	Rural	891	1 169	1 315	1 414	1 577	1 892
Overstrand	Rural	1 943	2 549	2 868	3 084	3 440	4 125
Pearly Beach	-	492	646	726	781	871	1 044
Pringle Bay	-	594	779	877	943	1 052	1 261
Rooi Els	-	57	75	84	90	101	121
Sandbaai	-	2 043	2 680	3 016	3 243	3 617	4 337
Silver Sands	-	516	677	762	819	913	1 095
Stanford	-	3 358	4 406	4 957	5 331	5 945	7 129
Van Dyksbaai	-	186	244	275	295	329	395
Zwelihle	-	6 178	8 106	9 120	9 807	10 937	13 116
Total		**53 373**	**70 026**	**78 790**	**84 729**	**94 486**	**113 308**

The socio-economic profile of the population in 2001, according to annual household income, is displayed in Table 1-2

Table 1-2: Population Profile According to Household Income (2001)

Main Town	Sub-area	No of Households	Population	Persons per Household	Very Low and Low Income	Middle Income	High and Very High Income
					R0 - R38400	R38401 - R76800	R76801 or more
Betty's Bay	-	86	188	2.2	26.7%	27.9%	45.3%
Betty's Bay	Klipkop	35	71	2.0	37.1%	40.0%	22.9%
Betty's Bay	Sunny Seas Estates	46	94	2.0	34.8%	23.9%	41.3%
Danger Point	Birkenhead	15	33	2.2	46.7%	33.3%	20.0%
Eluxolweni	-	104	288	2.8	102.9%	0.0%	2.9%
Fisherhaven	Lake Marina	187	475	2.5	34.2%	32.1%	33.7%
Franskraalstrand	-	414	889	2.1	37.2%	33.8%	29.0%
Gansbaai	-	356	903	2.5	61.8%	22.5%	15.7%
Gansbaai	Blompark	323	1 430	4.4	81.7%	15.5%	2.8%
Gansbaai	Die Kelders	429	951	2.2	34.3%	30.8%	35.0%
Gansbaai	Gansbaai	113	334	3.0	90.3%	6.2%	3.5%
Gansbaai	Groenewaldskema	182	736	4.0	88.5%	9.3%	2.2%
Gansbaai	Perlemoenbaai	119	296	2.5	42.9%	28.6%	28.6%
Hawston	-	1 547	6 618	4.3	77.3%	14.9%	7.8%
Hermanus	-	1 464	3 091	2.1	44.5%	19.5%	35.9%
Hermanus	Mount Pleasant	1 795	5 991	3.3	83.6%	11.0%	5.4%
Hermanus	Voelklip	467	960	2.1	29.3%	19.7%	51.0%
Highlands State Forest	-	21	57	2.7	95.2%	0.0%	4.8%
Kleinbaai	-	102	213	2.1	49.0%	32.4%	18.6%
Kleinmond	-	1 900	5 046	2.7	49.9%	24.4%	25.7%
Kleinmond	Protea	458	1 185	2.6	99.8%	0.0%	0.2%
Kogelberg State Forest	-	22	53	2.4	72.7%	13.6%	13.6%
Masakhane	-	707	2 014	2.8	95.6%	3.7%	0.7%
Onrusrivier	-	1 051	2 127	2.0	30.5%	30.7%	38.7%
Onrusrivier	Vermont	576	1 340	2.3	33.2%	22.9%	43.9%
Overstrand	Rural	582	1 732	3.0	72.3%	16.5%	11.2%
Overstrand	Rural	307	891	2.9	78.2%	13.4%	8.5%
Overstrand	Rural	696	1 943	2.8	76.7%	8.6%	14.7%
Pearly Beach	-	246	492	2.0	54.1%	25.6%	20.3%
Pringle Bay	-	293	594	2.0	38.9%	24.6%	36.5%
Rooi Els	-	30	57	1.9	43.3%	13.3%	43.3%
Sandbaai	-	847	2 043	2.4	36.0%	29.5%	34.5%
Silver Sands	-	206	516	2.5	56.8%	18.4%	24.8%
Stanford	-	959	3 358	3.5	74.6%	15.7%	9.7%
Van Dyksbaai	-	82	186	2.3	26.8%	34.1%	39.0%
Zwelihle	-	1 854	6 178	3.3	89.2%	8.6%	2.2%
Total		**18 621**	**53 373**	**2.9**	**63.2%**	**17.8%**	**19.3%**

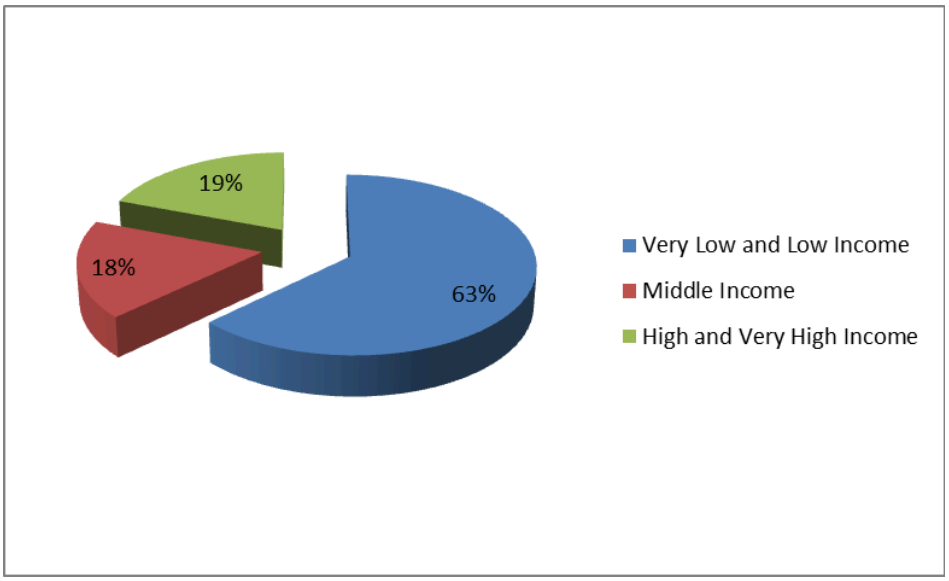

Figure 1-5: Graphical Display of Socio-Economic Distribution

From Table 1-2 and Figure 1-5 it is clear that a significant portion of Overstrand's population falls within the Low to Very Low Income classification, i.e. households with an income of less than R38,400 per annum.

Poverty "pockets" within the municipal area have been identified and listed below in Table 1-3

Table 1-3: Identified Poverty "Pockets" in Overstrand Municipality

Hermanus	Mount Pleasant- 2nd Phase
	Westdene
	Zwelihle
Pearly Beach	Eluxolweni
Stanford	Die Kop
	Thembelihle
	Stanford South
Gansbaai	Beverly Hills
	Blompark
	Masakane
	RDP Houses
Kleinmond	Beverly Hills
	Overhills
	Poppedorp
	Proteadorp
Betty's Bay	Mooiuitsig

The Provincial Treasury Socio-Economic Profile for the Overberg District and local municipalities-2006, provided the figures for illiteracy, skills level and job creation.

Overstrand Municipality at 19% has the lowest illiteracy rate in the District compared to Overberg District's value of 27%, Swellendam 35%, Cape Agulhas 24% and Theewaterskloof 32%, based on people older than 14 years of age with a formal education of less than grade 7.

Overstrand also has the highest skilled labour force as provided by the same source as illiteracy, as indicated in Table 1-4.

Table 1-4: Skills levels in the District

Area	High-skilled %	Skilled %	Low-skilled %
Overberg DM	13.2	36.8	50.0
Cape Agulhas	16.2	43.3	40.4
Overstrand	**18.1**	**44.4**	**37.5**
Swellendam	13.1	32.2	54.8
Theewaterskloof	9.9	32.1	58.0

A total of 4,568 new jobs were created in Overstrand during 2006, which is nearly half of the total jobs created for the Overberg District Municipality, i.e. 10,143.

1.4 TRANSPORT INFRASTRUCTURE

The road network of Overstrand can best be described as rural. The major roads are the R43 and R44, which effectively link most of the towns within the Overstrand Municipal boundaries. The R326 links Stanford with the N2 as well as with the R316 road between Caledon and Napier. The road infrastructure is currently in a good condition and as such does not pose a significant risk to the lifespan of the waste vehicles.

There are no railway lines in the Overstrand Municipal area.

1.5 AWARENESS AND EDUCATION

Generally 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. However, public awareness is quite notable in Overstrand due to the source separation initiatives of the municipality over the last number of years.

The successful implementation of the Overstrand 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.

Since Overstrand Municipality is continuously disseminating information on waste management to the public by means of municipal brochures, flyers and physical presence at fairs and other community activities, numerous successes have already been achieved.

1.6 BACKGROUND POLICY AND LEGISLATION

The fragmented and uncoordinated way pollution and waste has been dealt with, as well as insufficient resources to implement and monitor existing legislation, contributes largely to the unacceptably high levels of pollution and waste in South Africa. Through the promulgation and implementation of various pieces of policies, legislation, standards and guidelines as well as the implementation of co-operative governance as envisaged in the Constitution this situation will be improved.

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.

1.6.1 Constitution of the Republic of South Africa

In 1996 the new Constitution created a fundamental right to the environment. 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 to access to information. The lack of information is one of the major obstacles in environmental impact management. The Bill of Rights enshrines the right of access to information held by the State, or any other person, which is required for the exercise of any right. The section imposes a duty on the State to enact legislation to give effect to the right. The integrated pollution and waste management policy includes provisions concerning access to information insofar as it relates to future integrated pollution and waste management legislation.

- **Section 38**

  Provides *locus standii* 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 an individual or authority that is in the process of undertaking listed activities in terms of the NEMA EIA Regulations, without the necessary authorisation to undertake such activities.

- **Section 41**

  Provides principles for co-operative governance and intergovernmental relations. The Constitution allocates legislative authority as well as executive and administrative powers to all three levels of government. Schedules 4 and 5 determine the functional areas of government. For example, Schedule 5 allocates to Overstrand Municipality, as a local municipality, the function of "*refuse removal, rubbish dumps and solid waste disposal*".

- **Section 156**

Powers and functions of municipalities
(1)(a) A Municipality has executive authority in respect of, and has the right to the local government matter listed in Part B of Schedule 4 and Part B of Schedule 5.

Part B of Schedule 5 relating to Solid Waste Management:

- Refuse removal
- Refuse dumps
- Solid waste disposal

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. "

This 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, among other things, pollution and ecological degradation are prevented.

1.6.2 National Environmental Management Act

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 (NWMS), one of the key implications being the designation of the DEAT as lead agent for the environment. Chapter 7 of NEMA has important direct implications for the achievement of the NWMS initiative.

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

NEMA contains the following environmental principles:

- Environmental management must put people and their needs at the forefront, and must serve their interest fairly.
- Development must be socially, environmentally and economically sustainable. This means that the following things must be considered before there is development:

  a) Disturbance of ecosystems and loss of biodiversity
  b) Pollution and degradation of the environment
  c) Disturbance of landscapes and sites where the nation's cultural heritage is found
  d) Non-renewable resources must be used responsibly
  e) The precautionary principle must be applied
  f) Negative impacts must be anticipated and prevented and if they can't be prevented they must be minimized or remedied.

- Environmental management must be integrated. The best practical environmental option must be pursued.
- Environmental justice must be pursued so that there is not unfair discrimination in the way that negative environmental impacts are distributed
- There should be equitable access to environmental resources, benefits and services to meet basic human needs. Special measures may be taken to ensure access for persons disadvantaged by unfair discrimination.
- Responsibility for environmental health and safety of any policy, programme or project must continue throughout the life cycle of a project
- Public participation in environmental decision-making must be promoted. The participation of vulnerable and disadvantaged groups must be ensured
- Decisions must take into account the interests, needs and values of all interested and affected parties. This includes recognizing all forms of knowledge including traditional and ordinary knowledge
- Community well-being and empowerment must be promoted through environmental education
- The social, economic and environmental impacts of the activities must be assessed
- The rights of workers to refuse to do work that is harmful to human health or the environment and to be informed of dangers must be respected
- Decisions must be taken in an open and transparent manner and access to information provided in accordance with the law
- There must be inter government co-ordination and harmonization of policies and laws
- Actual or potential conflicts of interest between organs of state must be resolved through conflict resolution procedures
- Global and international responsibilities relating to the environment must be discharged in the national interest
- The environment is held in a public trust for the people and the use of environmental resources must serve the public interest, and be protected as the people's common heritage
- The polluter must pay for the costs of remedying pollution, environmental degradation and adverse health impacts
- The vital role of youth and women in environmental management must be recognized and their full participation promoted

- Sensitive or stressed ecosystems must receive special attention in planning which might affect them especially when they are subject to significant resource usage and development pressure.

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

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

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

The NEMA Environmental Impact Assessment Regulations

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

GN R 385 lays out two alternative authorisation processes. Depending on the type of activity that is proposed, either a Basic Assessment process or a Scoping and EIA. The regulations for both alternative processes stipulate that:

- Public participation must be undertaken at various stages of the assessment process;
- The assessment must be conducted by an independent Environmental Assessment Practitioner;
- The relevant authorities respond to the applications and submissions within stipulated time frames; and
- Decisions taken by the authorities can be appealed by the proponent or any other interested and affected party.

GN R 385 also makes provision for appeal against any decision issued by the competent authority. In terms of the Regulations, a notice of intention to appeal has to be lodged with the competent authority in writing within ten days of the notification of the issue of the Record of Decision. The appeal must be lodged within 30 days of the submission of the notice of intention to appeal.

On 3 July 2009 amendments to the list of activities, which many not commence without environmental authorisation as identified in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998)(NEMA) were published.
The following activities were omitted from Government Notice No. R 386:

- 1(o), 1(p), 1(s), 23(d), 23(e), 23(f) and 23 (g); and
- if the facility for the process or activity is included in the list of waste management activities published in terms of the Waste Act, then 24(c) and 25 are also excluded.

The following activities were omitted from Government Notice No. R 387:

- 1(f), 1(g), 1(o), 1(p), 1(q), and 1(r), and if the process or activity is included in the list of waste management activities published in terms of the Waste Act, then 1(e) is also excluded.

1.6.3 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.

1.6.4 The DWAF's Minimum Requirements (1998)

DWAF has compiled a set of guidelines called "The Minimum Requirements" of which the second edition was published in 1998. These guidelines are implemented through and enforced by the Landfill Site Permit. Once a Minimum Requirement is included in a Landfill Site Permit, it is legally enforceable.

1.6.4.1 Waste Classification

Waste types are graded into two classes, General (G) and Hazardous (H).

- General Waste (G) is a generic term applied to all urban waste that is produced within the domain of local authorities. It comprises rubble, garden, domestic, commercial and general dry industrial waste. It may also contain small quantities of household hazardous waste substances disposed within it e.g. batteries, insecticides, etc.

  General waste may be disposed of on any permitted landfill. However, General Waste sites located in areas with a positive climatic water balance must have leachate management systems, since General Waste can produce leachate with unacceptably high pollution potential.

- Hazardous Waste (H) is waste which has the potential, even at low concentrations, to have a significant adverse effect on public health and/or the environment. The following types of waste should be regarded as potentially hazardous, namely:

  Hazardous Waste is further classified in terms of Hazard Ratings, based on Acute Mammalian Toxicity, Ecotoxicity, Environmental bioaccumulation in the food chain and Chronic Toxicity. Hazardous Waste is thus classified into:

  Hazard Rating 1: Extreme Hazard
  Hazard Rating 2: High Hazard
  Hazard Rating 3: Moderate Hazard
  Hazard Rating 4: Low Hazard

1.6.4.1.1 Definition of Hazardous Waste

A Hazardous Waste is defined as:

"an inorganic or organic element or compound that, because of its toxicological, physical, chemical or persistency properties, may exercise detrimental acute of chronic impacts on human health and the environment. It can be generated from a wide range of commercial, industrial, agricultural and domestic activities and may take the form of liquid, sludge or solid. These characteristics contribute not only to degree of hazard, but are also of great importance in the ultimate choice of a safe and environmentally acceptable method of disposal."

Further to this, a Hazardous Waste can be defined as a waste that directly or indirectly represents a threat to human health or the environment by introducing one or more of the following risks:

- Explosion or fire;
- Infections, pathogens, parasites or their vectors;
- Chemical instability, reactions or corrosion;
- Acute or chronic toxicity;
- Cancer, mutations or birth defects;
- Toxicity, or damage to the ecosystems or natural resources;
- Accumulation in biological food chains, persistence in the environment, or multiple effects to the extent that it requires special attention and cannot be released into the environment or be

added to sewage or be stored in a situation which is either open to air or from which aqueous Leachate could emanate.

The definition of Hazardous Waste is very broad, since wastes can vary substantially in nature, composition, size, volume, appearance and degree of harmfulness. In terms of the Minimum Requirements, therefore, Hazardous Wastes are grouped into four Hazard Ratings

This further classification, termed the Hazard Rating, differentiates between a Hazardous Waste that is fairly or moderately hazardous and one that is very or extremely hazardous. The Hazard Rating also indicates the class of Hazardous Waste landfill at which the waste may be disposed.

Hazard Rating 1 (extreme risk)
Hazard Rating 2 (high risk) } = H:H Landfill

Hazard Rating 3 (moderate risk)
Hazard Rating 4 (low risk) } = H:H or H:h Landfill

An H:H landfill is more stringently designed, operated and monitored than an H:h landfill.

1.6.4.1.2 Classification of Hazardous Waste

There are four steps in the classification of a Hazardous Waste

- Identification of the waste or waste stream as probably Hazardous.
- Testing and analysis to determine the hazardous properties, characteristics and components of a waste. This will confirm whether the waste is Hazardous or not.
- Classification and treatment in accordance with SANS Code 0228 “The Identification and Classification of Dangerous Substances and Goods”.
- Analysis and Hazard Rating of the waste or its residue, in order to determine the Hazard Rating and the Minimum Requirements for disposal.

An additional step would be re-examination of an existing classification with the objective of possible delisting and reclassification. This would apply in cases where, because of pre-treatment, low concentration, low mobility or other applicable factors, waste can delist to a lower Hazard Rating.

1.6.4.1.3 Analysis to confirm that a waste is a Hazardous Waste

If it is probable that the waste is a Hazardous Waste, it must be tested for its properties and analysed for its substances. These are then compared to the lists of characteristics, properties and substances in SANS Code 0228, the Basal Convention, and the Waste Classification Tables in the Minimum Requirements.

If the properties and substances of the waste are not listed in SANS Code 0228, but conform to the Basel Convention or one of the nine classes in the Code, the waste is probably a Hazardous Waste. The Department should then be approached for guidance.

1.6.4.1.4 SANS Code 0228

SANS Code 0228: “The Identification and Classification of Dangerous Goods and Substances” is a system for classifying hazardous substances for transport purposes. In the Code, hazardous substances are given an identification number and divided into nine classes:

Class 1	Explosives
Class 2	Gases
Class 3	Flammable liquids
Class 4	Flammable solids
Class 5	Oxidising substances and organic peroxides
Class 6	Toxic and infectious substances
Class 7	Radioactive substances
Class 8	Corrosives
Class 9	Other miscellaneous substances.

The waste must be tested against the nine classes, to see into which class it falls (it may fall into more than one class). The Minimum Requirements for that class must then be complied with.

The Hazardous Waste classification table is derived from SANS Code 0228. The typical generators of Hazardous Waste are divided into typical industrial groups. The groups indicate an industry which is expected to generate the largest quantity of Hazardous Waste material. DEA is currently finalising the new Hazardous Waste Classification system.

1.6.5 The Western Cape Health Care Waste Management Act, 2007 (Act 7 of 2007)

In the Western Cape, a Health Care Management Bill was submitted to Parliament. 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 (HEALTH CARE RISK WASTE). Health Care Risk Waste generally indicates infectious waste, pathological waste, sharps, chemical and pharmaceutical waste, radioactive and cytotoxic waste.

1.6.6 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, licenses 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).

1.6.7 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.

1.6.8 Municipal By-Laws

In terms of Section 13 of the Local Government Systems Act 2000, (Act 32 of 2000), the Overstrand municipality made a solid waste by-law dealing with the containment and disposal of solid waste. The by-law was published in the Provincial Gazette 6423 of Friday, 9 March 2007. This by-law addresses various issues such as:

Section 1: Definitions

Section 2: Removal of refuse refers to charges, charge exemptions, number of bags per property and the enforcement of additional services if so required.

Section 3: Notice to Council: Property owner notification of service discontinuation, etc.

Section 4: Provision of containers: Provision of business containers, numbers thereof and charges are determined by Council. Private residents must obtain suitable animal proof containers when required.

Section 5: Containers: Business: Areas for placement and collection of containers at business premises.

Section 6: Use and care of containers and bin liners: Residential areas. Containers are placed out on the side walk, a maximum of 1 m within the property; cleaned and suited for the required area. “Baboon-areas” require animal proof containers while other areas are allowed to place solid waste in black bags.

Section 7: Disposal of solid waste: No person shall dispose of waste in an unacceptable manner, by means of burning or dispose of hazardous waste without council permission. Disposal of hazardous waste is only in accordance with special conditions and requirements such as no disposal of HCW in council containers. Certain areas may have different collection systems than other.

Section 8: Containers in problem animal areas: Animal proof containers as approved by Council must be used.

Section 9: Disposal of bulky Refuse: Bulky waste must be disposed of within 14 days of generation in a site allocated by Council. At the request of the owner, Council may remove such bulky refuse and charge the owner.

Section 10: Disposal of builder's rubble: Builder's rubble may be disposed of for the purpose of land reclamation with written Council consent; special containers for the containment and disposal may be determined by Council; disposal must not to be later than 1 month after generation.

Section 11: Special Industrial/ Medical and Hazardous waste: Council must be informed by the generator of the chemical composition, quantity, storage facilities, removal and final disposal. The chemical composition is to be presented as an analysis by an industrial chemist; no nuisances may be caused during storage; disposal in permitted landfills only.

Section 12: Landfill sites: No person shall dispose of waste on a landfill without a permit and such a person must supply the permit, identify the waste type and operate within the criteria of acceptable waste types, container size and landfill permit conditions; enter and exit at the same designated point/ gate; shall not possess/use liquor on the landfill; pay a tariff when required; council is not liable for claims resulting from access to landfill.

Section 13: Ownership of refuse: All refuse removed by the Council or waste placed in the landfill or abandoned objects are the property of the Council.

Section 14: Dumping of litter: No person shall discard, abandon or dump litter on any land or water. Dumped litter may only be deposited in a Council approved facility; litter in public places must be deposited in refuse bins. **Of interest is that no person shall dispose/dump/discard litter OR ALLOW ANY PERSON to do the same**. - Council may remove such litter and hold the property owner and/or the generator of litter responsible for such costs.

Section 15: Access to premises: There must be access to Council for collecting and removing refuse if a service is provided and suspend such a service if damage or harm may be caused to Council property or workers.

Section 16: A Council resolution declares areas as problem animal areas and may be revised from time to time.

Section 17: Pavements: The owner must ensure that the pavement in front of his house is kept free of refuse except on collection day.

Section 18: Recycling: All waste generators, as determined by Council, must divide their refuse in recyclable and non-recyclable according to Council directives. Recycled waste must be placed in clear bags (or set aside) for separate collection.

Section 19: Repeal of by-laws: By-laws may be repealed by Council when required.

Section 20: Offences and penalties: Any person who contravenes the by-law or fails to comply is guilty of an offence and liable for conviction to a penalty.

Section 21: Short Title: By-law is called the Overstrand Municipality: Solid Waste Management By-law, 2006. 9 March 2007.

1.6.9 National Waste Management Strategy

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

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

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

The Strategy is built around a framework of eight goals, as listed below, along with specific goals that 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 recyclables diverted from landfill sites for re-use, recycling or recovery.
- All Metropolitan Municipalities, secondary cities and large towns have initiated separation at source programmes.

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

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

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

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

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

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

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

The strategy aims to reduce both the generation and the environmental impact of waste. It presents a plan for ensuring that the socio-economic development of South Africa, the health of its people and the quality of its environmental resources are no longer adversely affected by uncontrolled and uncoordinated waste management. It establishes a waste management system that concentrates on avoiding, preventing and minimising waste and makes provision for waste management services for all by extending an acceptable standard of waste collection, as well as transportation, treatment and disposal services to all communities.

While the long-term objective of the strategy is waste prevention and minimisation, a number of remedial actions such as improved waste collection and waste treatment are required in the shorter term due to prevailing inadequate waste management practices.

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

To implement the Waste Act, government must:

- Draft legislation, regulations, standards and Integrated Waste Management Plans.
- Regulate waste management activities through licenses 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.

1.6.10 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.

1.6.11 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 organisations 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 matters.

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.

1.6.12 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.

1.6.13 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 license 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 license 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 license 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 license for a waste disposal facility is subject of the inclusion in the license 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).

1.6.14 White Paper: Policy on Pollution Prevention, Waste Minimisation, Impact Management and Remediation (March 2000)

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

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

Although South Africa has extensive environment, pollution and waste management legislation, responsibility for its implementation is scattered over a number of departments and institutions.
The fragmented and uncoordinated way pollution and waste is currently being dealt with, as well as the insufficient resources to implement and monitor existing legislation, contributes largely to the unacceptably high levels of pollution and waste in South Africa.
The White Paper on Integrated Pollution and Waste Management will result in a review of the existing legislation and the preparation of a single piece of legislation dealing with waste and pollution matters.

Pollution and waste management is not the exclusive preserve of government. The private sector and civil society have crucial roles to play. The fostering of partnerships between government and the private sector is a prerequisite for sustainable and effective pollution and waste management to

take place. Similarly, the spirit of partnerships and co-operative governance between organs of state is equally important due to the crosscutting nature of pollution and waste management.

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

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

The policy presents seven strategic goals, which are as follows:
Goal 1: Effective Institutional Framework and Legislation
Goal 2: Pollution Prevention, Waste Minimisation, Impact Management and Remediation
Goal 3: Holistic and Integrated Planning
Goal 4: Participation and Partnerships Governance in Integrated Pollution and Waste Management
Goal *5:* Empowerment and Education in Integrated Pollution and waste Management
Goal 6: Information Management
Goal 7: International Cooperation

The role of Local Government

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

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

1.6.15 Planning Documents

The Provincial Spatial Development Framework (November 2005)

The PSDF states that there is a concern that a number of waste landfill sites are not properly managed. In addition to the challenges of managing increasing waste volumes and decreasing land available for waste disposal, the Western Cape, along with other Provinces, has to deal with waste management problems caused by inequitable development and inadequate service delivery. Waste issues are often closely associated with poverty, environmental health and social justice issues. The following Policies have particular reference:

RC32 All municipalities shall follow an integrated hierarchical approach to waste management consisting of the following, avoidance/reduce, reuse, recycle, composting, treatment and final disposal. The Waste Management System shall consist of a collection service from the source, (domestic, office or factory) transfer stations and waste disposal sites. (M)

RC33 Waste separation at source shall be mandatory in all domestic households and institutions and businesses including high density and multi-storey buildings from a date to be announced. Initially only organic (vegetable and plant matter) and inorganic (usually dry, cardboard, glass, plastics, paper, builders' rubble) waste shall be separated. (M)

RC34 Material Recovery Facilities shall be established at all Transfer Stations. (M)

RC35 Engage with the raw material and packaging industries and reach agreement to ensure demand for recycled products. (G)

RC36 Every urban settlement should have a Transfer Station within a maximum of 5kms from the town centre, inside the Urban Edge. These Transfer Stations shall be properly managed according to best practice so as to minimise nuisance to surrounding neighbours. They should also be open after hours and on the weekends and their locations shall be well publicised so as to ensure that the community uses them. Furthermore, charges should not be levied on loads brought to transfer stations. Micro enterprises wanting to process waste and trade second hand materials on site should be encouraged. (G)

RC37 Every municipality shall have a Waste Disposal facility site located and operated according to DWAF's minimum requirements that will service the Transfer stations in the urban settlements in that municipality. These sites may or may not be located within the Urban Edge of urban settlements. The main criteria for their location will be to meet satisfactory environmental and transport requirements. (M)

It is the intention of the Western Cape Government to make relevant policies contained in the WCPSDF mandatory in terms of legislation and to include these policies in appropriate legislation. These policies are indicated with a 'M' next to the applicable policy in Chapter 8 of this report. The balance of the policies is indicated with a 'G' to indicate that they are guiding principles. The distinction should be understood as follows:

Mandatory (M) measures refer to policies that are regarded as being of sufficient social, economic or environmental importance as to demand that every effort possible should be made to effectively implement that policy.

Guidelines (G) refer to policies that are intended as general developmental goals and whose detailed implementation may vary due to place specific conditions and therefore requiring a certain amount of flexibility in their application.

2. WASTE MANAGEMENT STATUS QUO IN OVERSTRAND MUNICIPALITY

2.1 WASTE QUANTITIES AND TYPES

2.1.1 Waste Quantities

For the purpose of determining the waste quantities in Overstrand, the population statistics from census (refer to Sub-section 1.3 - Demographics) were used to calculate the total tonnage of municipal solid waste (MSW), using typical waste generation figures per person of each socio-economic sector of the community. The rural waste quantities were not included in the tables below.

The waste quantities and waste generation figures were adjusted with the help of weighbridge data from the Overstrand. The Gansbaai Landfill is equipped with a weighbridge as well as Karwyderskraal, so all generated waste in the Overstrand is weighed and recorded. Karwyderskraal will not receive general waste until the construction of cell 3 is complete, but still receives chipped garden waste and builder's rubble. However, by applying these accurate waste quantities to the population figures to acquire the average waste generation rates per person, it becomes clear that the census data is not completely accurate.

From the weighbridge data accumulated since April 2010, it can be seen that the incoming waste stream does not increase significantly during the holiday season as would be expected. This can be attributed to the fact that the coastal towns of the Overstrand receive tourists and holidaymakers constantly throughout the year and not only during season. Many home owners in the Overstrand only visit on weekends and are therefore not recorded in the census among the permanent population, but contribute to the total waste stream on a semi-permanent basis. For this reason, the waste generation rate per person per day in Table 2-1 below will reflect a figure that is higher than expected.

2.1.2 Volumes of General Waste generated

It follows that domestic waste generation in the urban areas of Overstrand can be depicted as follows:

Table 2-1: Waste Volumes calculated for Overstrand Municipality

Main Town	Sub-area	Population (2011)	Waste Generated in Tonnes/year (2011)	Average Waste Generation Factor for Area in kg/p/d
Betty's Bay	-	288	283	2.69
Betty's Bay	Klipkop	109	88	2.22
Betty's Bay	Sunny Seas Estates	144	133	2.53
Danger Point	Birkenhead	51	38	2.06
Eluxolweni	-	441	197	1.23
Fisherhaven	Lake Marina	727	642	2.42
Franskraalstrand	-	1 361	1 148	2.31
Gansbaai	-	1 382	910	1.80
Gansbaai	Blompark	2 189	1 086	1.36
Gansbaai	Die Kelders	1 456	1 296	2.44
Gansbaai	Gansbaai	511	236	1.27
Gansbaai	Groenewaldskema	1 127	521	1.27
Gansbaai	Perlemoenbaai	453	370	2.23
Hawston	-	10 131	5 511	1.49
Hermanus	-	4 732	4 017	2.33
Hermanus	Mount Pleasant	9 171	4 608	1.38
Hermanus	Voelklip	1 470	1 472	2.74
Highlands State Forest	-	87	39	1.22
Kleinbaai	-	326	239	2.01
Kleinmond	-	7 725	5 930	2.10
Kleinmond	Protea	1 814	727	1.10
Kogelberg State Forest	-	81	48	1.64
Masakhane	-	3 083	1 302	1.16
Onrusrivier	-	3 256	3 021	2.54
Onrusrivier	Vermont	2 051	1 938	2.59
Pearly Beach	-	753	542	1.97
Pringle Bay	-	909	798	2.40
Rooi Els	-	87	78	2.45
Sandbaai	-	3 128	2 750	2.41
Silver Sands	-	790	578	2.00
Stanford	-	5 141	2 916	1.55
Van Dyksbaai	-	285	269	2.59
Zwelihle	-	9 458	4 345	1.26
Total		**74 716**	**48 076**	**1.76**

Due to the fact that Overstrand Municipality is made up of various towns that are geographically located along the coastline, it is important to consider the population distribution across these towns as this is an indication of where the waste will be generated and where the waste will be delivered to. This information is extremely helpful in determining the capacities of the various infrastructural facilities.

Non-Hazardous Industrial Waste

Non-hazardous industrial waste has been included in the above volumes.

Builder's Rubble

The recorded volumes of builder's rubble average on 3400 tonnes per annum. These volumes are included in Table 2-1.

Public Cleansing Waste

No separate data is available and has therefore been included in the above volumes.

2.1.3 Recoverable Material Volumes

Due to the lack of a proper scientifically-based waste composition study done in the Overberg on a sufficiently large sample that represents seasonal effects as well as different socio-economic communities, the anticipated waste composition of the Overstrand will be based on composition studies performed on behalf of DEA&DP during 2007 as well as other recent studies done on similar communities. Although these samples were insufficiently small, it provides perhaps the best "estimate". From these studies it can be derived that the following percentages (by mass) of recoverable material could be present in Overstrand's general waste stream:

Paper and Card board:	20%
Plastics:	13%
Glass:	6%
Metal:	4%

From the waste composition as reflected above, it can be calculated that the total volume of recoverable materials that are theoretically available in the waste stream will be as indicated in Table 2-2.

Table 2-2: Volumes of Available Recoverable Materials

Main Town	Sub-area	PAPER/ CARD (t/a)	PLASTICS (t/a)	GLASS (t/a)	METAL (t/a)
Betty's Bay	-	53.54	34.80	16.06	10.71
Betty's Bay	Klipkop	16.47	10.71	4.94	3.29
Betty's Bay	Sunny Seas Estates	25.08	16.30	7.52	5.02
Danger Point	Birkenhead	7.06	4.59	2.12	1.41
Eluxolweni	-	34.91	22.69	10.47	6.98
Fisherhaven	Lake Marina	120.90	78.58	36.27	24.18
Franskraalstrand	-	215.48	140.06	64.64	43.10
Gansbaai	-	167.75	109.04	50.33	33.55
Gansbaai	Blompark	194.67	126.54	58.40	38.93
Gansbaai	Die Kelders	244.07	158.65	73.22	48.81
Gansbaai	Gansbaai	41.97	27.28	12.59	8.39
Gansbaai	Groenewaldskema	92.62	60.20	27.79	18.52
Gansbaai	Perlemoenbaai	69.22	45.00	20.77	13.84
Hawston	-	997.57	648.42	299.27	199.51
Hermanus	-	754.58	490.48	226.38	150.92
Hermanus	Mount Pleasant	826.79	537.41	248.04	165.36
Hermanus	Voelklip	279.17	181.46	83.75	55.83
Highlands State Forest	-	6.89	4.48	2.07	1.38
Kleinbaai	-	44.38	28.85	13.31	8.88
Kleinmond	-	1106.16	719.01	331.85	221.23
Kleinmond	Protea	126.60	82.29	37.98	25.32
Kogelberg State Forest	-	8.86	5.76	2.66	1.77
Masakhane	-	228.44	148.48	68.53	45.69
Onrusrivier	-	570.49	370.82	171.15	114.10
Onrusrivier	Vermont	366.47	238.21	109.94	73.29
Pearly Beach	-	100.52	65.34	30.15	20.10
Pringle Bay	-	150.22	97.64	45.07	30.04

Main Town	Sub-area	PAPER/ CARD (t/a)	PLASTICS (t/a)	GLASS (t/a)	METAL (t/a)
Rooi Els	-	14.73	9.58	4.42	2.95
Sandbaai	-	517.70	336.51	155.31	103.54
Silver Sands	-	107.38	69.80	32.21	21.48
Stanford	-	530.07	344.55	159.02	106.01
Van Dyksbaai	-	50.94	33.11	15.28	10.19
Zwelihle	-	771.21	501.29	231.36	154.24
Total		**8842.93**	**5747.90**	**2652.88**	**1768.59**

Note: Based on Volume 1 - Report on the Waste Characterisation Survey undertaken at selected landfill sites in the Overberg District, June 2007, PDNA for DEA&DP

Due to the methods of collection, i.e. the collection of mixed un-separated household waste, 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 fraction 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. Overstrand Municipality has already introduced separation at source in various areas within the municipality and is planning the extension of these services.

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 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 that 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.

Statistics obtained from the various “separate bag” collections as are currently practised on a private contract base in the City of Cape Town, indicate that separation at source participation rates of up to 85% are readily achievable in the middle and higher income groups. The degree of contamination in the “separate bag” is significantly lower and the average “tailings” percentage achieved is approximately 10%. *(Source: WastePlan)*

With the assumed strategy of source separation and “clean” Material Recovery Facilities where the source separated materials are sorted into its various groups and sub-groups, and assuming that only middle and higher income group communities will be participating in source separation, it can be calculated that the current (2011) recovery volumes will be as indicated in Table 2-2.