



INTEGRATED WASTE MANAGEMENT PLAN

(Second Edition)

FEBRUARY 2009

Compiled by:



JAN PALM CONSULTING ENGINEERS

P O Box 931
BRACKENFELL, 7561

Tel: (021) 982 6570
Fax: (021) 981 0868
E-pos: info@jpce.co.za

OVERSTRAND MUNICIPALITY
INTEGRATED WASTE MANAGEMENT PLAN

INDEX

EXECUTIVE SUMMARY	1
1. PREFACE	5
1.1 INTRODUCTION.....	5
1.2 GENERAL DESCRIPTION.....	5
1.2.1 GEOLOGY AND HYDROGEOLOGY.....	7
1.2.2 HYDROLOGY	8
1.3 DEMOGRAPHICS.....	12
1.4 TRANSPORT INFRASTRUCTURE	15
1.5 AWARENESS AND EDUCATION	15
1.6 BACKGROUND POLICY AND LEGISLATION.....	15
1.6.1 CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA	16
1.6.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT	17
1.6.3 ENVIRONMENTAL CONSERVATION ACT	19
1.6.4 HEALTH ACT, ACT 63 OF 1977 AND THE WESTERN CAPE HEALTH CARE WASTE MANAGEMENT DRAFT BILL	21
1.6.5 NATIONAL WATER ACT (ACT NO. 36 OF 1998).....	22
1.6.6 NATIONAL ENVIRONMENT MANAGEMENT: AIR QUALITY ACT 2004 (ACT NO. 39 OF 2004)...	22
1.6.7 MUNICIPAL BY-LAWS.....	23
1.6.8 NATIONAL WASTE MANAGEMENT STRATEGY	24
1.6.9 WHITE PAPER ON EDUCATION AND TRAINING (1995)	25
1.6.10 THE MUNICIPAL SYSTEMS ACT (ACT 32 OF 2000)	25
1.6.11 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE BILL	25
1.6.12 WHITE PAPER: POLICY ON POLLUTION PREVENTION, WASTE MINIMISATION, IMPACT MANAGEMENT AND REMEDIATION (MARCH 2000)	26
1.6.13 PLANNING DOCUMENTS.....	28
2. WASTE MANAGEMENT STATUS QUO IN OVERSTRAND MUNICIPALITY.....	29
2.1 WASTE QUANTITIES AND TYPES	29
2.1.1 METHODOLOGY FOR GENERAL WASTE SURVEY	29
2.1.2 VOLUMES OF GENERAL WASTE GENERATED	29
2.1.3 METHODOLOGY FOR INDUSTRIAL WASTE SURVEY	30
2.1.4 VOLUMES OF HAZARDOUS WASTES GENERATED	30
2.1.5 RECOVERABLE MATERIAL VOLUMES.....	31
2.2 WASTE AVOIDANCE.....	35
2.2.1 WASTE AVOIDANCE BACKGROUND	35
2.3 COLLECTION SYSTEMS	36
2.3.1 MUNICIPAL WASTE COLLECTION SYSTEMS	36
2.3.2 PUBLIC CLEANSING.....	40
2.4 WASTE REDUCTION	40
2.4.1 RECOVERY FOR RECYCLING	40
2.4.2 COMPOSTING.....	41

2.5	WASTE DISPOSAL.....	41
2.5.1	OPERATING LANDFILLS	41
2.5.2	CLOSED LANDFILLS	43
2.5.3	BUILDER'S RUBBLE SITES.....	43
2.5.4	WASTE TRANSFER STATIONS	43
2.5.5	PUBLIC DROP-OFF FACILITIES	43
2.5.6	DISPOSAL FACILITIES USED OUTSIDE THE OVERSTRAND BOUNDARIES.....	43
2.6	COSTS OF EXISTING WASTE MANAGEMENT SYSTEM	44
2.6.1	FINANCIAL SUMMARY OF WASTE MANAGEMENT SERVICES OF OVERSTRAND MUNICIPALITY	44
2.6.1.1	INCOME	44
2.6.1.2	EXPENSES	44
2.7	STAFF COMPLIMENT OF EXISTING WASTE MANAGEMENT SYSTEM	45
2.8	CURRENT WASTE MANAGEMENT CONCLUSION	51
2.9	WASTE MANAGEMENT STRATEGIC OBJECTIVES	51
2.9.1	STRATEGIC OBJECTIVES	52
2.9.2	DEFINITIONS.....	52
2.10	ROLE OF OVERSTRAND MUNICIPALITY	52
3.	OVERSTRAND MUNICIPALITY'S IMLEMENTATION INSTRUMENTS.....	54
3.1	IMPLEMENTATION INSTRUMENTS FOR WASTE AVOIDANCE	54
3.2	IMPLEMENTATION INSTRUMENTS FOR WASTE REDUCTION	58
3.3	IMPLEMENTATION INSTRUMENTS FOR WASTE DISPOSAL	60
3.4	IMPLEMENTATION INSTRUMENTS FOR WASTE MANAGEMENT IN GENERAL	61
4.	OVERSTRAND MUNICIPALITY'S IMLEMENTATION SCHEDULE	64
5.	CONCLUSIONS AND RECOMMENDATIONS	66
5.1	CONCLUSIONS	66
5.2	RECOMMENDATIONS	67

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
DWAF	Department of Water Affairs & Forestry
EH	Environmental Health
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
Haz	Hazardous
HCGW	Health Care General Waste
HCRW	Health Care Risk Waste
HCW	Health Care Waste
HDPE	High Density Polyethylene
kg	kilogram
kℓ	kilolitre
ℓ	litre
LDV	Light Delivery Vehicle
m ³ pa	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	HCRW Contractor in Cape Town

Standards used in Report:

- 1 kg = 1ℓ
- 1 kℓ = 1 m³ = 1 tonne
- Weight of 1 lazer 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 DISCRIPTION

The second 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 75 000 people. The IWMP is a statutory requirement of the new Waste Management Act which has as it's 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 bylaws and in accordance with an implementation schedule.

Overstrand Municipality is the 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 report also stipulated the various applicable sections of the National Environmental Management Act, National Water Act, Atmospheric Pollution Prevention Act and the National Waste Management Strategy.

The new Waste Management Act has been enacted on 10 March 2009, after this WMP has been compiled. Certain changes to this document will be made during the public consultation period to reflect the spirit of the Waste Management Act.

EXISTING WASTE MANAGEMENT

METHODOLOGY AND CURRENT STATUS

The methodology of General Waste data collection is based on physical visits to the Operational Managers of the four service areas and the confirmation of waste volumes with them based on actual truck loads.

Hazardous Wastes and Health Care Wastes are being surveyed during March and April 2009 and the findings will be published in the final report.

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

WASTE AVOIDANCE

Currently waste avoidance and minimisation are not being practiced to any significance.

COLLECTION

All formal residential erven in the Overstrand area are receiving a weekly door-to-door collection service.

The towns located in the Greater Kleinmond and Greater Hermanus service areas also receive a weekly collection service for source-separated recyclables. The towns within Greater Gansbaai and Stanford areas will receive a similar source-separation collection service from 1 July 2009.

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. The materials collected through source separation are sorted at the premises of Walker Bay Recycling.

Material recovery also takes place behind the Hermanus Transfer Station on a concrete slab under a lean-to structure. This almost informal recovery effort, although it is formal, recovers approximately the same amount of recyclable material than that are recovered by the current source-separation initiative. The Municipality plans to construct a Material Recovery Facility as a replacement for the current lean-to structure. Construction of the structure is to be completed at the end of June 2009 and the mechanical equipment is to be supplied, installed and commissioned during the third quarter of 2009.

Informal recycling is also practised at the waste disposal site at Gansbaai. The Municipality plans to construct a Material Recovery Facility at the Gansbaai Landfill and construction of the structure is to be completed at the end of June 2009 and the mechanical equipment is to be supplied, installed and commissioned during the third quarter of 2009. This facility will sort the source separated waste from the Greater Gansbaai and Stanford areas.

Statistics on the recycling volumes indicate that the total tonnage of recycled material is currently only 3.3% of the total municipal solid waste stream. Walker Bay Recycling recovers an additional 5.4% of the total municipal solid waste stream.

WASTE DISPOSAL

Disposal of municipal solid waste in Overstrand is practiced at the regional Karwyderskraal as well as the local Gansbaai Landfills in accordance with all the relevant legislation. A number of closed waste sites are still to be rehabilitated.

The communities of Greater Hermanus and Greater Kleinmond have access to a waste transfer station for convenient drop-off of their non-collected wastes, such as garden wastes, general "Saturday-wastes" and household hazardous wastes.

The communities of Rooi-Els, Pringle Bay, Betty's Bay, Hawston, Fishershaven and Voelklip have the use of a public drop-off facility over and above their weekly collection service. The community of Gansbaai, being in closer proximity to a Landfill, has the convenience of taking their non-collected wastes directly to the Landfill. The Municipality are planning to construct public Drop-offs at Stanford (during April to June 2009), Pearly Beach (second half of 2009) and Baardskeerdersbos (second half 2010).

COSTS OF EXISTING WASTE MANAGEMENT

The 2008/9 financial year indicates a waste management operating cost of R31,110,160 against an operating income of R33,402,400. The cost of waste management relates to approximately R412 per resident per year.

GIS

The municipal GIS system does not currently reflect waste management data and the population of the GIS with such data will follow the implementation of the future statutory waste information system.

STAFF RESOURCES

The Cleansing Department of Overstrand currently has only two vacant posts.

Although municipal waste management in the Overstrand appears to be well managed, the main focus still appear 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 extremely low.

This report 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 report 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 report 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 report 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 Management Act coming into effect on 10 March 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 Management Act, it now is.

To achieve the above, this report 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 can not be avoided so that no material of value nor anything that can decompose, gets disposed. Furthermore will it be the aim of Overstrand Municipality to dispose the waste that can not 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
- Separate collection of source separated materials
- Separate collection of spent oils, solvents, print cartridges, x-ray and photographic developers by recovery contractors
- 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, and
- The publishing of Prevention Guidelines to assist waste generators.

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, 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 make use of the regional licensed landfill at Karwyderskraal, but continuous extension of these facilities will be required to maintain sufficient airspace for waste disposal. The closed small waste disposal sites near the smaller towns shall also be rehabilitated within the next three 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.

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

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.

OVERSTRAND MUNICIPALITY

INTEGRATED WASTE MANAGEMENT PLAN

1. **PREFACE**

1.1 **INTRODUCTION**

A Draft Integrated Waste Management Plan of Overstrand Municipality has been 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 has been compiled by the Directorate: Pollution and Waste Management of DEA&DP and has been 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.

This review and updating of the Draft IWMP will attempt to follow the above guideline, since the guideline and checklist developed/used by DEA&DP could not yet be obtained from DEA&DP.

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 can not be prevented, and
- The safe disposal of waste that can not be recovered

The Plan will address all areas of waste management – from waste prevention and minimisation (Waste avoidance), to its collection, 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.



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 Papiessvlei 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 Cedarberg 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.

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.