REPUBLIC OF SOUTH AFRICA

Water Quality Management Series

Policy Document U 1.3

Managing the Water Quality Effects of Settlements: -

THE NATIONAL STRATEGY

EDITION 2

Department of Water Affairs and Forestry

SEPTEMBER 2001

Water Quality Management Series

POLICY DOCUMENT U 1.3

MANAGING THE WATER QUALITY EFFECTS OF SETTLEMENTS:-

THE NATIONAL STRATEGY

EDITION 2

Department of Water Affairs and Forestry

SEPTEMBER 2001

DOCUMENT INDEX

This document forms part of the Department of Water Affairs and Forestry's National Strategy for Managing the Water Quality Effects of Settlements. It represents one of the outputs of a project that was jointly funded by the Department of Water Affairs and Forestry and the Danish Government via their DANCED program.

The Department of Water Affairs and Forestry reports in this series are: -

Policy Documents

Managing the Water Quality Effects of Settlements.
The National Strategy, Edition 1. Policy Document U 1.1

Managing the Water Quality Effects of Settlements
Considerations for the Sustainable Management of Pollution from Settlements. Policy Document U 1.4

Managing the Water Quality Effects of Settlements
The National Strategy. Edition 2, Policy Document U 1.3

Operational Guidelines

Managing the Water Quality Effects of Settlements.
Options for Interventions Guide. Operational Guideline U 1.2

How to implement the National Strategy.
Guidelines for DWAF and CMA staff. Operational Guideline U 1.5

How to implement the National Strategy.
Guidelines for Local Authority staff. Operational Guideline U 1.6

How to implement the National Strategy.
Guidelines for Community members. Operational Guideline U 1.7

Technical Supporting documents

The Capacity Gap in Local Government
The Financial component of the Capacity Gap
The Economic Impacts of Pollution in two Towns
An Assessment of the Non-payment Problem
Legal Considerations for Managing Pollution from Settlements
Awareness and Capacity building
The National Costs of Pollution from Settlements
A Communications Strategy

These reports are all available on an interactive CD-ROM titled:-
An Interactive Guide to Implementation – Policy Document U 1.4

Additional copies of this report, or other reports in this series, may be ordered from:

DIRECTOR: WATER QUALITY MANAGEMENT
DEPARTMENT OF WATER AFFAIRS AND FORESTRY
PRIVATE BAG X 313
PRETORIA
0001

APPROVAL

TITLE: Managing the Water Quality Effects of Settlements:-
The National Strategy: Policy Document U 1.3

PROJECT MANAGER: Manda Hinsch

REPORT STATUS: Final

DATE: January 2002

Policy Document U 1.3 is approved for implementation by the Department of Water Affairs and Forestry.

JLJ van der Westhuizen
Director: Water Quality Management

M Hinsch
Deputy Director: Urban Development and Agriculture
Project Manager

G Quibell
Carl Bro International
Project Manager (Consultancy)

ACKNOWLEDGEMENTS

This series of reports is the result of a collaborative effort from a great many people. The inputs of all these contributors are gratefully acknowledged. However, special mention must be made of the following:-

- The members of the Test Case Steering Committees in each of the Test Cases, who gave of their time freely to helping test the Strategy. These members are listed on the following pages.
- The Regional Deputy-Directors:- Water Quality in each region. These DWAF staff members are also listed on the following page.
- Members of the Project Steering Committee.
- Danced staff involved with the project. In particular Ms Mapule Makoro, Dr Albert Welinder, and Ms Jackie Friedenthal
- Dr Morten Riemer, the Project Monitor.

The financial contribution from Danced, and the Danish Government is also gratefully acknowledged.

The following consultants have contributed to the development of this series of reports.

International Consultants

- Gavin Quibell – Project Manager (Consultancy): Carl Bro
- John Charlton: Carl Bro
- Christian Sørensen: Carl Bro
- Charlotte Mathiassen: Carl Bro
- Gitte Jakobson: Carl Bro

Local Consultants

- Guy Pegram: Pegasus Strategic Resource Management
- Tim Hart: Resource Development Consultants
- Gerrie Muller: Resource Development Consultants (and other staff)
- Geraldine Schoeman: Afrosearch
- Romy van Jaarsveld: Romy van Jaarsveld Consultants
- Hubert Thompson: Thompson and Thompson
- Seetella Makhetha: Makhetha Development Consultants.

The CD for the project was developed by ISIFUNDI IT Consultants.

Development of the community documents, the community poster and the Newsletters for the project was facilitated by Manyaka-Greyling-Meiring.

REGIONAL DEPUTY DIRECTORS ~ WATER QUALITY MANAGEMENT		
Northern Province	Victor Mongwe	
Mpumalanga	Dr Magda Ligthelm	
Gauteng North	Johan Maree	
Gauteng South	Marius Keet	
Free State	Dr Johan van der Merwe	
North West	Petrus Venter	
KwaZulu Natal	Lin Gravelot-Blondin	
Eastern Cape	Andrew Lucas	
Western Cape	Gareth McConkey	
Northern Cape	Jurgen Streit	
TEST CASE STEERING COMMITTEE MEMBERS		
KAYA MANDI		
Cllr NA Mgijima (Chair)	Cllr C Mcako	Cllr MW Kalazana
Cllr BL Makasi	Cllr MM Ngcofe	Cllr LN Qoba
Cllr MP Xegwana	Cllr W Ortell	V Mayataza
N Mrali	M Mayembana	J Kotze
J Fourie	M Brand	F Wium
J Barnes	W Kloppers	S Menziwa
MONNAKATO		
P Molebatsi (Chair)	B Nkomo	R Kgosane
E Moselo	E Mahlalela	
MASIZAKHE		
A Lumkwana (Chair)	J Ngalimani	T Mbalula
M Mbalula	Cllr T Afrika	M Motoane
D Stander	M Thibani	S Ngalimani
N Mfazwe	Z Mbalula	F Rossouw
PHUTHADITJHABA		
S Mokoena (Chair)	P Moeti	N Dlamini
M Mbele	S Sepheka	M Selepe
G Ntshwana	Tholo	F Mafokeng
R Moeketsi	P Mokoena	J Molapi
A Radebe	K Tlabana	A Mokoena
KLIPTOWN		
J Legoale (Chair)	D Kgasi	S Langa
N Sehole	D Ntshangase	L Msibi
M Nxusa	F Gathoo	G Kubheka
B Mpyana	P Maleka	F Mzolo
H Mbhele	P Motlanthe	J Twala
S Tokoloshe		
CAIRN		
D Mabaso (Chair)	S Dube	J Dube
R Khoza	N Lubisi	L Ngomane

BURLINGTON HALT		
KM Jaggeth (Chair)	A Brown	FI Nakooda
M Mbambo	B Naidoo	JD Vedan
R Rughubar	V Maclou	D Moonean
K Sibiya	P Govender	J Mathela
V Nkumane	T Madlala	P Majozi
S Gumbi	C Cele	PS Nzimande
M Mbambo	W Khuzwayo	X Camni
G Goniwe	P Mngadi	J Msomi
B Buthelezi	M Veco	P Mntu
W Phalala	M Mngade	D Vorster
NYLSTROOM		
BAJ Matshoge (Chair)	M Ledwaba	P Kekana
M Manganye	P Nkoana	M Moagi
Mr Mabula		
GRAHAMSTOWN/RINI		
N Titi (Chair)	M Nelani	T Mnyungula
WM Mngcongo	V Mame	S Mzizi
C McClaughan	S Mfecane	NK Mdana
N Ncapayi	SE Mdoko	N Stamper
AD Mkize	MN Kulati	K Jezi
H Sikweza	S Potelwa	D Sakatha
T Mzamo	T Horner	

PROJECT STEERING COMMITTEE	
JLJ van der Westhuizen	DWAF ~ Water Quality Management
M Hinsch	DWAF ~ Water Quality Management
A Weinder	Danced ~ Copenhagen
R Kruger	Dept of Provincial & Local Government ~ CMIP
R Captain	Office of the Premier ~ Mpumalanga
C Crawford	DWAF ~ Water Services
R Beukman	Dept of Land Affairs
J Crowder	NASCO
J Eshen	Johannesburg Metropolitan Local Council
H Formanek	Southern Groundwater
N Muller	Dept of Provincial & Local Government ~ CMIP
A Vienings	Water Services Support Unit ~ SALGA
N van den Berg	IMESA
A Vermeulen	DWAF ~ Water Services
B Aleobua	DWAF ~ Groundwater Services
P Jonssen	DANCED ~ Pretoria
I Lamont	Dept Provincial & Local Government ~ CMIP
A Brown	Burlington Halt Steering Committee Representative
K Jezi	Rini Steering Committee Representative
J Matshoge	Phagameng Steering Committee Representative
S Mensiwa	Kaya Mandi Steering Committee Representative
D Mabaso	Cairn Steering Committee Representative
P Molebatsi	Monnakato Steering Committee Representative
J Legoale	Kliptown Steering Committee Representative
S Mokoena	Phuthaditjhaba Steering Committee Representative
A Lumkwana	Masizakhe Steering Committee Representative
M Riemer	Project Monitor
G Quibell	Project Manager
M Nel	Project Secretary

PREFACE

Pollution from densely populated and poorly serviced settlements is perhaps one of South Africa's most *important*, but most *complex* water quality problems.

Important, because pollution in and from these settlements not only affects downstream users, but has its most significant impacts on the communities living in these settlements. Failing sanitation and waste removal systems create appalling living conditions in many settlements, and contribute to serious health problems in these communities. Pollution in and from these settlements is, therefore, not only a water quality issue, but has much wider implications for government's aims to provide a better life for all

Complex, because pollution in settlements is rooted in the socio-economic, political and institutional conditions in the settlement. The use, or misuse, of services together with the way in which the services are maintained by Local Authorities lies at the heart of the pollution problem in many settlements. This is further complicated by the legacy of South Africa's apartheid history. Solutions, therefore, lie in changing the way in which the services are supplied and used.

However, *sustainable* solutions to the problem lie not only in our ability to supply and use waste and sanitation services to best effect, but also in the longer-term capacity of local government to maintain these services. This is likely to be the biggest stumbling block to sustainable management of pollution from settlements. Local government in South Africa clearly has significant capacity problems, and misuse of services, for a variety of reasons, is endemic in many settlements across the country. More importantly, failing waste services contribute to poor living conditions, and hence to the misuse of the services. Non-payment for services also limits the capacity of the Local Authority to effectively maintain the services, which then leads to further failure of the services.

Strategies to manage pollution in settlements must take a broader view of both Local Authority capacity, and the socio-economic and political dynamics of the community in order to arrest this downward spiral. The Department of Water Affairs and Forestry, therefore, initiated a study of the links between pollution, community perceptions and local government capacity, to run in parallel with the Test Cases. A number of reports have been produced to support this study.

It is hoped that these reports provide compelling arguments to address this problem both by ensuring better planned and run services, but also by active intervention and assistance where there are clear and immediate threats to community health and the environment. This report forms part of this process, and is intended to help those responsible for managing pollution in and from settlements to start addressing this problem. The reader should also be aware that this is a dynamic document, and it will be updated from time to time. These updates may be downloaded from the Department of Water Affairs and Forestry web site (www.dwaf.gov.za).

EXECUTIVE SUMMARY

SECTION 1:- INTRODUCTION

Pollution from densely populated settlements is perhaps one of South Africa's most important but most complex pollution problems. It not only effects downstream users, but has its most important impacts on the community itself. Pollution creates appalling living conditions in many settlements, and the consequent health impacts are recognised as the leading cause of death in developing nations.

However, pollution from settlements is rooted in the complex socio-economic and socio-political conditions in out poorest communities. Many stakeholders are therefore pessimistic about our ability to address this problem in a sustainable way. However, a joint project between the Department of Water Affairs and Forestry (DWAF) and the Danish Government's DANCED programme, has shown that it is possible to address pollution from settlements.

A number of Test Cases have shown that it is possible to identify and address the root causes of pollution using South African expertise and South African sources of funding. This document collates the experiences from these Test Cases, and outlines how the Department of Water Affairs and Forestry will roll out these approaches in priority settlements across the country.

SECTION 2: - WATER RESOURCES MANAGEMENT IN SOUTH AFRICA

Introduction

The National Strategy to Manage the Water Quality Effects of Settlements forms part of DWAF's overall approaches towards Water Resources Management. In this respect, the Strategy is a source-directed strategy that will form one of the supporting strategies of the Catchment Management Strategy (CMS). These will in turn give effect to the National Water Resource Strategy (NWRS). The approaches developed also recognise DWAF's overarching policies towards stakeholder participation, and the need to aim at waste prevention or minimisation as a first option.

What is a settlement?

A settlement can refer to any area of human habitation, from single dwellings to high-rise blocks of flats in city centres. The approaches outlined in this report can be used to address pollution from any of these sources. But, the approaches are entrenched in the need for co-operative governance with Local Authorities, and are therefore suited to address most pollution problems from this sector. This includes non-point source problems within the settlements themselves as well as problems with the maintenance and operation of sewage pump stations and Sewage Treatment Works. However, as the amount of waste that can reach the water resource is closely associated with the size and density of the settlement, as well as the level and operation of services that are in place to remove this waste, the approaches are primarily focussed on addressing pollution from densely populated and poorly serviced areas.

Finding the right balance

DWAF's approach to water resource protection is founded on resource directed measures that specify different levels of protection for different classes of water resource. The National Strategy therefore focuses on trying to find an appropriate balance between the Class of the receiving Resource, the Size and Density of the Settlement, and the Level and Operation of Waste Services – while maintaining financial sustainability within local government.

SECTION 3:- THE CAUSES OF POLLUTION FROM SETTLEMENTS

The underlying causes

Pollution from settlements is caused by the *physical* failure of waste disposal and/or sanitation services. However, these *physical* causes are normally underlain by *social* and *institutional* causes. *Social* causes stem from the misuse of the system, either through a lack of awareness or sometimes the deliberate misuse of services. *Institutional* causes arise when the service provider does not maintain or operate the services properly. Pollution from settlements is usually caused by a combination of all these factors.

What is the role of local government capacity?
Local government capacity influences the way in which waste removal services are both supplied and maintained (i.e. the *institutional* causes). A "capacity gap" exists in any case where the capacity required to ensure effective operation and maintenance of the waste services was not matched by the capacity available. There are many cases where this capacity gap has resulted in a failure of the waste management systems, which has lead to severe pollution of the water resource. A lack of financial resources often lies at the heart of this capacity gap problem. Many Local Authorities in South Africa are facing severe financial difficulties. These Local Authorities tend to reduce spending on operation and maintenance in order to service their debt. This leads to a failure of the systems, and hence to increasing pollution problems. The sustainability of interventions rests on addressing this capacity gap in the longer term.

What role does the community play?
The community's misuse of the services is a major contributor to pollution in many settlements (i.e. the *social* causes). Littering and the deliberate dumping of household refuse is rife in many settlements, even where solid waste removal services have been supplied. In other settlements there is vandalism of the services, for example waste bins that are used for other purposes, or deliberate destruction of sewer piping or toilet systems – often as a form of protest.

In most cases the community's misuse of the services appears to stem from a lack of awareness, or poor maintenance and operation of the waste removal systems (for example unsanitary toilets that are not used by the community). These problems can be addressed by building awareness in the community or by building better service provider/consumer relationships. But, more intractable problems have emerged in some cases. These may be related to the use of the sewer systems to hide the evidence of crime, or misuse of the services related to wider political or social issues (for example vandalism by the disaffected youth, or to try to secure something better).

What role does the level of services play?
While, higher levels of services offer greater opportunities to collect and safely dispose of waste generated in the settlement, they come at a greater risk. They are more expensive to operate, have more opportunities for failure and require greater capacity within the service provider. Capacity gap problems are therefore more likely to emerge with higher levels of services. Lower levels of services provide fewer opportunities to safely dispose of the waste, and therefore pose some risks to water resources. But, the risks of failure are significantly lower as they do not require sophisticated treatment or distribution systems.

What is the role of non-payment?
Non-payment for services is pervasive in many Local Authorities in South Africa. This robs the Local Authority of capacity and contributes to the pollution problem. While many households cannot afford to pay for the full operating and maintenance costs of services, most can contribute to the costs of services. However, where high levels of services have been installed the opportunities for adequate cost recovery are lower. Nevertheless, in most towns even partial cost recovery would make significant inroads into addressing the pollution problem. The major problem, therefore, seems to be related to a complete lack of payment in many households – especially in those households with some income.

What is the role of local government budgeting?
Many of the institutional causes of pollution are associated with the resources allocated to operation and maintenance of the waste management services. Local Authorities are allocating smaller and smaller budgets (in real terms) to operation and maintenance of waste services. This means that less and less is available for effective maintenance of the services. However, local government is hesitant to curtail spending on salaries by cutting back on staff, or by limiting salary increases to ensure adequate budgeting for operations and maintenance.

What is the role of women?
Women and children are most often responsible for the disposal of waste in these settlements. They must therefore be involved in identifying the root causes of pollution, and in finding suitable solutions. More importantly, women more readily accept the dual social and institutional causes of pollution and are therefore important to provide a more balanced view of the causes of pollution.

What is the role of environmental factors?
Environmental factors like, rainfall, steep slopes, proximity to the water resource, the class of the water resource, the depth to the groundwater and the type of soil - increase the impacts of settlements on the water resource.

What is the role of poverty?
Poverty, pollution, non-payment, and the misuse of services are all highly interdependent. Where waste is left in the settlement, the community is less likely to take care when disposing of waste, to pay for services, and to report breakdowns in service provision. This increases the resources required to maintain the services and robs the service provider of capacity, which leads to further pollution. The additional demands on the local health care system further drain local resources. This "pollution cycle" further entrenches the problem, and active intervention from outside is normally required to break the cycle.

SECTION 4: - THE COSTS OF POLLUTION FROM SETTLEMENTS
What "costs" are associated with pollution from settlements?
Pollution in settlements not only affects downstream users, but also impacts on the community itself. The implications or costs of dense settlements pollution are therefore wide ranging, and include health costs, social costs, environmental and downstream water use costs.

What are the community health "costs"?
Failing waste systems increase the risks of contact with faecally contaminated effluent in the settlement, or from transmission of faecal material by insects which breed in waste. In South Africa as many as 43 000 deaths per year have been attributed to non-existent or poor and failing sanitation. The recent cholera epidemic ravaging many of our poorest communities is a graphic reminder of these risks. This project has estimated up to 1.5 million of diarrhoea cases could be associated with failing sanitation systems. The financial costs associated with treating these cases are as high as R150 million per annum. The costs to the Local Authority of treating diarrhoeal disease can make up a significant proportion of their spending on operation and maintenance, while the direct costs to the poor can be in the range of R100-R200 per household per year.

What are the environmental "costs"?
Biomonitoring has shown a significant loss of biodiversity downstream of highly polluted settlements. In some cases pollution from failing sanitation systems has depleted oxygen in short stretches of river. This creates a "plug" in the river preventing the migration of fish for breeding. World-wide increasing urbanisation, and the associated pollution, is recognised as a major cause of a loss of biodiversity.

What are the social "costs"?
The social costs to pollution lie primarily in the perpetuation of the poverty cycle. Diseases associated with pollution in settlements keep children from school, robbing them of development opportunities. Similarly adults may be prevented from going to work. In many settlements sanitation services are shared, further increasing the indignity and threats of diarrhoea. People living in polluted settlements are often demoralised, and are more likely to pollute their environment or to vandalise services. Communities in these settlements have little pride in their area, which promotes further pollution and makes it difficult to get community upliftment projects off the ground.

What are the downstream "costs"?
The downstream costs of pollution from settlements are associated with eutrophication of drinking or recreational waters. Eutrophication increases the costs of treating water to potable standards, and may also result in algal blooms that are toxic to both humans and livestock. The increases in treatment costs that result from settlements pollution in South Africa has been estimated at R 64 million per annum.

How widespread is the problem?
This project has estimated that some 20-30% of Local Authorities have high proportions of poor households on high levels of services. These Local Authorities are unlikely to be able to recover the full costs of their waste services from within their service area, and are hence more likely to suffer capacity gap problems.

SECTION 5:- LEGAL CONSIDERATIONS FOR MANAGING POLLUTION FROM SETTLEMENTS

The Constitution

The Constitution specifies the responsibilities of local and national government with respect to waste services and protection of the resource. In this respect, local government is responsible for providing and maintaining waste services in their settlements, however national government (i.e. DWAF) can specify how this needs to be done in order to protect the water resource. Over and above this the Constitution places special obligations for co-operative governance between all spheres of government. The approaches are therefore based on cooperative approach to addressing pollution from settlements.

The National Water Act

The National Water Act (NWA) contains a number of provisions to that could be used to regulate the way in which local government exercises its powers with respect to activities that may pollute the water resource. However, nationally applicable norms and standards to address pollution from settlements are difficult to formulate. Moreover, the history of interaction between local government and water quality management staff seems to indicate that it would be very difficult to enforce these standards. However, cooperative agreements can be made to bind all the parties to the agreed set of interventions. DWAF or Catchment Management Agencies may wish to formalise these agreements as Directives under sections 19 or 20 of the NWA under certain circumstances.

The Water Services Act

The Water Services Act (WSA) makes provision for both financially and environmentally sustainable water services (which includes sanitation services), by requiring Water Service Providers to develop Water Services Development Plans (WSDP). These provisions, as well as provisions in the Local Government: Municipal Systems Act, provide the opportunity to offer advice on appropriate levels of service. More importantly, interaction with local government with respect to ensuring that these plans are developed and implemented, provide the most suitable vehicle to give effect to co-operative agreements on pollution management with local government. Co-operative agreements developed under this Strategy must therefore be included in the WSDPs.

The Water Services Act also provides for intervention by the Minister of Water Affairs and Forestry in local government, via the Provincial Legislature, where Service Providers have not met their obligations in terms of the Act. These provisions could be used to intervene with respect to pollution problems.

The Local Government: Municipal Systems Act

This Act primarily focuses on local governments internal systems and administration. Most importantly, it makes provision for linking and integrating plans at a local government level within an Integrated Development Plan (IDP), and to align local government resources to give effect to this plan. As such, co-operative agreements with local government to address the causes of pollution in settlements must be included in the WSDP, and hence into the IDP, to ensure that adequate resources are allocated to addressing these causes.

SECTION 6:- FINANCING INTERVENTIONS

Sources of funds for addressing pollution from settlements

Most Local Authorities will not be in a position to invest large amounts of capital into addressing pollution from settlements without recourse to national sources of funding. In this respect Local Authorities could tap into a number of sources of funds. These are;

- *The Consolidated Municipal Infrastructure Programme (CMIP)* – this is useful where bulk infrastructure or bulk infrastructure repairs are needed to address pollution.
- *Home Owner Subsidies* – this is useful to influence the installation of basic services in new housing developments.
- *Pollution and catchment levies* – These will be useful where there are significant downstream water quality impacts.

- *Donor funds* – These are useful where it can be demonstrated that there are clear environmental benefits, and where there has been significant community participation.
- *Municipal Rates* – These are useful in the larger Municipalities that have a significant rates base or large industries.
- *Equitable Share Funds* – This is that portion of nationally raised revenue that is made available to local government. This is useful to help the poorer Local Authorities ensure effective operation and maintenance of waste services.
- *Mayibuye Funds* – While not ideally suited for waste services, these funds can be used to influence appropriate services for greenfields developments.
- *Private-Public-Partnerships* – These are useful where the community can take over some of the operation and maintenance of their services and recover the costs of these.

Seed funding to identify the causes of pollution
The Test Cases have shown that nominal seed funding is useful to help identify the underlying causes of pollution. Once this has been done, other sources of funding can be identified to address these causes.

SECTION 7:- THE NATIONAL STRATEGY

Reactive and proactive intervention
Reactive interventions would be used where regional DWAF, or Catchment Management Agencies want to address downstream water quality problems associated with pollution from settlements. *Proactive interventions* are aimed at planning appropriate services, as well as ensuring the ongoing effective management of waste and sanitation services, even where the impacts on the water resource are less significant.

Identifying Reactive interventions
A "Structured-Facilitated" process will identify reactive interventions. This aims to facilitate dialogue between DWAF (or the CMA), the Local Authority (as the service provider), and the community. It is aimed investigating the problem in increasing depth until consensus and is reached on the root causes of pollution. This process will also help identify appropriate sources of funding to help the Local Authority address these causes.

This process will be rolled out by identifying priority polluting settlements in each region or catchment, and approaching the Local Authorities managing these settlements. The "Structured-Facilitated" process will then be initiated with the Local Authority and community. The result of this process will be a set of interventions. These agreements will be written into the Water Services Development Plan or into the Integrated Development Plan. This will ensure that these interventions are integrated into the Local Authorities budgeting process.

Planning reactive interventions in priority settlements
The roll out of reactive measures will occur via the water resources planning processes. In this respect the National Water Resources Strategy will identify those Water Management Areas (WMAs) where pollution from settlements is important. The Catchment Management Strategies in these WMAs will then have to give special attention to this source, but would have to identify priority settlements and sub-catchments that will need to be addressed using the "Structured-Facilitated" process. In the interim DWAF regional offices will identify and address priority settlements.

Promoting proactive interventions
Proactive interventions will be promoted by ongoing capacity building within local government with respect to the links between pollution and local government financing and capacity. This will include ongoing support for non-payment campaigns, and advice on appropriate levels of services for settlements.

Opportunities for seed funding
The National Strategy has identified the need for a "seed funding" facility. This facility will aim at providing nominal seed funding to identify the causes of pollution using the Structured-Facilitated process. The facility will then help identify other local sources of funding that could be used to implement the resultant Intervention Plan. These Intervention Plans would also be included into the WSDP or IDPs.

TABLE OF CONTENTS

SECTION ONE

INTRODUCTION

1.1 Background

South Africa's Department of Water Affairs and Forestry (DWAF) has the mandate to manage the country's water resources. To do this, the Department must not only ensure the equitable distribution of water to all South Africans, but must also protect the water resource for future generations. This requires the Department to manage the quality of the resource.

DWAF has long recognised that pollution from densely populated, and poorly serviced areas, is one of the greatest threats to the quality of South Africa's water resources. Failing sanitation and waste management systems[1] not only create appalling living conditions in many settlements, but also cause downstream water quality problems. Faecal pollution from these areas poses health threats to the community, and nutrient pollution contributes to the eutrophication of downstream waters. Both of these are recognised as some this country's most widespread water quality problems (Pegram, Quibell and Görgens, 1997).

However, the Department has recognised that the water quality effects of settlements have their origins in the complex social and institutional conditions in our poorest communities. The capacity of local government to supply and manage services in these areas also lies at the heart of the pollution problem. These problems cannot be addressed in the same way as pollution from other sectors. Many stakeholders were therefore pessimistic about our ability to address this problem in a sustainable way.

The Department therefore approached the Danish Government to assist them to develop an approach to managing the water quality effects of settlements. The Danish Government's Danced programme initiated funding for the project, "To develop a strategy to manage the water quality effects of settlements" in June 1997

1.2 The history of the project

This project has been undertaken in three Phases. **Phase 1** of the study focused on developing a *Draft National Strategy*. However, this Phase made little provision for stakeholder participation, and a **Bridging Phase** was proposed. This provided the opportunity to get comments on the Draft Strategy, and to update it accordingly. At the end of the Bridging Phase, the first edition of the National Strategy was produced as a DWAF policy document.

While these documents provided the basis for implementing the strategy, it was realised that a second phase of the project was necessary to effectively anchor the strategy in South Africa. **Phase 2**, which was initiated in January 1999, therefore included activities to more widely disseminate the National Strategy, to train stakeholders to implement it, and to demonstrate its efficacy in nine Test Cases. Phase 2 also included a number of studies that were aimed at creating a suitable executing and policy environment for the strategy. The experiences gained in these processes have been used to produce this second edition of the National Strategy.

[1] "waste" is defined as any material that is suspended, dissolved or transported in water, and which is spilled or deposited on land or into a water resource which may cause the water resource to become polluted.

1.3 What is the aim of this report

This report outlines the Department of Water Affairs and Forestry's approach towards managing the water quality effects of settlements. The document describes the underlying causes of pollution, and how dialogue between the community and service providers will be used to identify these causes. The document also outlines how DWAF will ensure the gradual roll out of these approaches in settlements across the country.

> This document is **not** intended to outline detailed procedures for the provision of services, or to provide a procedural guide on how to identify appropriate interventions for any settlement. These details may be found in the "How To" Section

1.4 Who should read the report?

This document is aimed at: -

⇒ *DWAF regional water quality management staff to*: -

- promote an understanding of the causes of pollution from settlements,
- outline how the Department will roll out the National Strategy, and
- indicate how appropriate interventions may be identified and implemented.

⇒ *DWAF head office water quality management staff to*:-

- outline the Department's policy with respect to managing pollution from settlements
- develop an understanding of the underlying causes of pollution in settlements, and
- promote the implementation of the Strategy on a national basis.

⇒ *Agencies associated with the planning, development and servicing of settlements to*:-

- Indicate DWAF's intentions for managing pollution from settlements, and
- Promote the implementation of the Strategy by these agencies.

⇒ *Tertiary training institutions to*:-

- Incorporate the approaches outlined in their curricula with respect to pollution management and environmental health.

1.5 The structure of the report

This report is structured as follows:-

Section 2: Outlines DWAF's approach toward water resources management, and the integration of this Strategy with these approaches.

Section 3: Describes the underlying causes of pollution from settlements. This provides a basis for stakeholders to understand and start addressing these causes.

Section 4: Highlights the social, environmental and economic "costs" of pollution in and from settlements. This provides arguments for financial intervention to address the problem.

Section 5: Outlines the legislative basis for managing pollution from settlements.

Section 6: Describes the sources of funding that could be used to implement and sustain interventions aimed at addressing pollution from settlements.

Section 7: Describes the process that can be used to identify the underlying causes of pollution in settlements, and the strategy for the roll out of these processes in priority settlements. This section also describes how the Strategy supports other initiatives aimed at environmentally sustainable service delivery.

SECTION TWO

WATER RESOURCES MANAGEMENT IN SOUTH AFRICA

2.1 Introduction

The Department of Water Affairs and Forestry has published, and is still in the process of developing, a number of strategies for water resources management. These underpin the South African government's wider goals of poverty alleviation and economic growth. These overarching policies provide the framework for this Strategy. This section describes some of these overarching policies, and how the National Strategy to manage the Water Quality Effects of Settlements has been integrated with the broader goals of Government.

KEY ISSUE

Integration of this Strategy with wider national policies provides the opportunity to align the approaches toward managing the water quality effects of settlements with other activities the Department, and in Government as a whole. This will help entrench this Strategy and secure its sustainability.

2.2 Water quality management policies in South Africa

DWAF recognises that it is impractical to maintain a pristine water environment, however economic growth and social development cannot result in unsustainable use of the water resource (DWAF 1991). Long-term economic growth is also not possible without protecting the quality of the water resource. Water quality management, therefore, requires balancing protection of the water resource with the need for development and growth in South Africa. This balance can only be found given active public participation in water quality management. DWAF's approach to water quality management consequently rests on active public participation.

Within the ambit of these principles, DWAF proposes a precautionary approach to water quality management. This means that positive actions should be taken to avert or minimise the risk of impacts on the water environment, even when these impacts cannot be directly proven. Water quality management decision making therefore follows a hierarchy of:-

- ***Firstly, preventing or minimising waste*** through reduction at source. This is done by reducing the amount of waste produced by recycling, neutralisation or detoxification of wastes. (i.e. Waste prevention and Waste minimisation)
- ***Secondly, reducing the amount of waste, which reaches the water resource*** by establishing effluent standards**,** or management practices that trap and remove the waste before it reaches the water environment**.** (Impact minimisation)
- ***Lastly, exemptions from waste standards or management practices*** only where it can be shown that the receiving water's fitness for use will not be significantly reduced.

(DWAF, 1995)

To be consistent with this philosophy, this Strategy focuses on methodologies to prevent or reduce the production of waste within the settlement, rather than trap and treat options to minimise the

amount of waste reaching the water resource. The National Strategy, therefore, outlines methodologies to identify and address the causes of pollution within the settlement, rather practices to limit the waste reaching the water resource.

KEY ISSUE

The Department of Water Affairs and Forestry's overarching approaches towards water quality management have underlain the development of this Strategy, and will guide the implementation of the Strategy within polluting settlements.

2.3 The National Water Act (Act 36 of 1998)

2.3.1 Water Resources Management Strategies

The National Water Act makes provision for the development of water resources management strategies. These provide the framework all water resources management, and hence for approaches to manage the water quality effects of settlements.

Sections 5 to 7 of the National Water Act outline the establishment of a *National Water Resource Strategy* (NWRS). This aims at strategic water resources management, such as the provision of water for important industries and international obligations. The NWRS also provides the overarching framework for water resources management in South Africa. As part of this framework, the NWRS has divided the country into 19 *Water Management Areas.* Water resources management will be devolved to these Water Management Areas, but water resources management in these areas must still be consistent with the NWRS. Future versions of the NWRS will focus attention on particular water resources issues in different Water Management Areas to ensure critical national problems are addressed.

Catchment Management Strategies (CMS) will be developed for each of the Water Management Areas (Sections 8 & 9 of the NWA). These provide for the management of water resources at a local level, and will focus attention on particular water resources problems and pollution sources. The CMS is therefore supported by cross cutting strategies addressing different aspects of water resources management. These may include strategies to manage groundwater problems, strategies for water demand and conservation, strategies to manage pollution from mines or, in this case, to address pollution from settlements.

This report focuses on addressing pollution from one source type, densely populated settlements, and is one of the cross cutting supporting Strategies. As such it forms one of the building blocks of both the NWRS and the CMSs (see Figure 2.1).

2.3.2 Resource and Source directed measures

DWAF's approach towards water resources protection rests on two legs: *Resource-* and *Source-*directed measures. Resource directed measures set the goals for resource protection. This will be done within a *Water Resource Classification*[2] system. This allows for different levels of protection for different water resources. Sensitive receiving environments, like dolomitic groundwater resources, and rivers with a high conservation value will receive greater management attention, and pollution sources in these areas may be required to implement more stringent management

[2] DWAF has not yet published the Water Resources Classification system. However, this system is likely to make provision for at least three classes. Highly protected resources, resources where the emphasis will be on protection, and resources where the emphasis will be on sustainable use.

practices. The National Water Act specifies that *Resource Quality Objectives* (RQOs) will be established for different water resources. These are aimed at specifying appropriate numeric and narrative objectives for different water resources, and can include indicators of water quality, as well as the biological and physical characteristics of the resource.

Resource directed measures make provision for the "Reserve", which is that quantity and quality of water required to maintain the aquatic ecosystem and for basic human needs. The "Reserve" is the only use of water by right, and must get priority attention when managing water resources. The National Water Act requires that all water resources management practices and strategies must give effect to the Reserve, the RQOs, and to the *Water Resource Classification* system. Resource directed measures therefore not only set the water quality goals for managing pollution from settlements, but also help focus attention on settlements most in need of attention. The integration of the Resource Directed measures and the National Strategy is discussed in more detail in the report on Planning to avoid Pollution from Settlements.

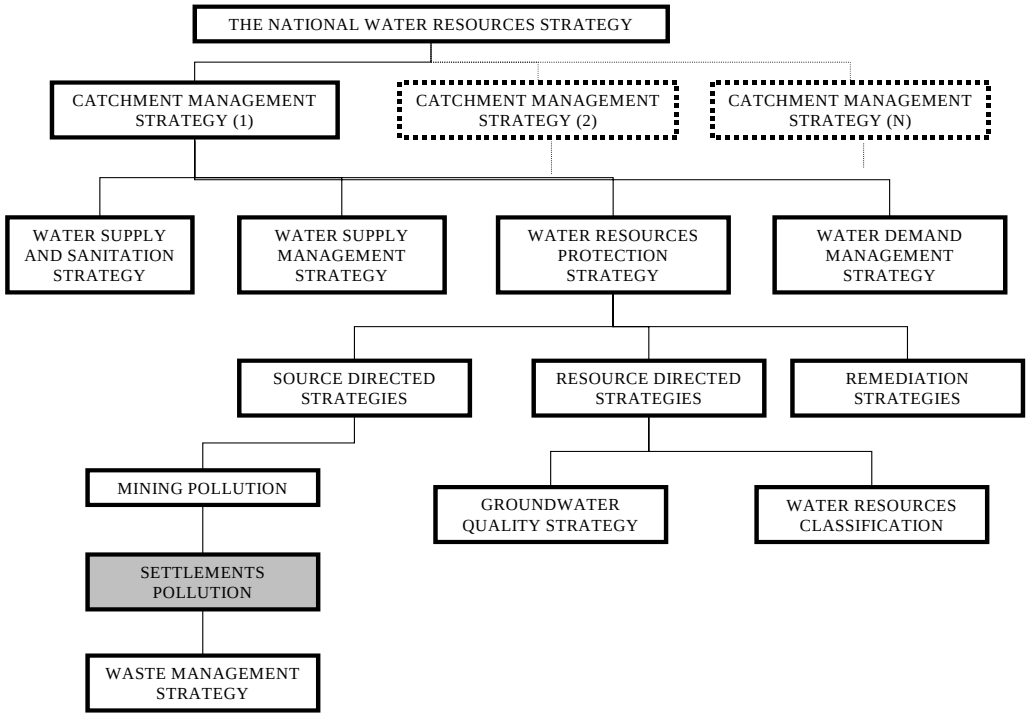


Figure 2.1. The positioning this Strategy within DWAF's wider approaches towards Water Resources Management. The Dense Settlements Strategy is a cross cutting tool, that will support source directed management within the Catchment Management Strategy.

DWAF have produced resource directed strategies aimed at protection of the groundwater resource (DWAF, 1997a). These aim *inter alia* to control on-site sanitation systems (mostly pit latrines) where geological conditions indicate a threat to the groundwater resource. This has significant implications for appropriate sanitation options in settlements, and directly affects implementation of this Strategy. (It is recommended that the reader refer to the *Policy and Strategy for Groundwater Quality Management* - DWAF, 2000).

Source-directed measures allow for the setting of standards (or management practices) that are appropriate for different pollution sources. These standards aim to *minimise* the impact on the water resource, and will be implemented using the precautionary approach and the decision hierarchy outlined in the previous section. The source-directed provisions, therefore, allow for the

setting of appropriate standards and methods to address both point and nonpoint source pollution from specified sources. This Strategy aims at one of these sources, densely populated and poorly serviced settlements (see Figure 2.1).

2.3.3 Integrating with wider government policies

The White Paper on a Water Policy for South Africa (DWAF, 1997b) indicates that water resources management must support wider national policies towards service delivery and poverty alleviation. This is particularly important for this Strategy, as the provision and maintenance of services for the poor has a significant impact on pollution from settlements. As such, the implementation of this Strategy must be closely aligned with wider national policies towards poverty alleviation and services provision. Implementation of the National Strategy to Manage the Water Quality Effects of Settlements is therefore part of government's overall approach towards poverty alleviation and service provision, and is specifically focussed on breaking the cycle of poverty and pollution. See Section 3.10.

2.4 The Water Services Act (Act 108 of 1997)

The Water Services Act focuses on the provision of environmentally and financially sustainable water services provision within local government. This will be given effect by the development and implementation of Water Services Development Plans (WSDP) by each Local Authority in South Africa. These will not only address the provision of new services to under-serviced communities, but will also include plans for the operation and maintenance of existing services. The Water Services Development Plans will, therefore, also address pollution from settlements, both in terms of installing appropriate services for under-serviced communities, but also to ensure the effective operation and maintenance of existing services.

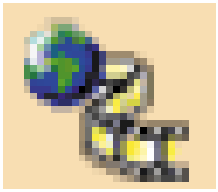
The Water Services Act also provides statutory obligations to Local Authorities (as water services providers) to develop WSDPs. The WSDPs will in turn form part of the Integrated Development Planning (IDPs) process initiated by the Department of Provincial and Local Government. These IDPs are tied to local government budgeting processes, and as such the Water Services Development Plans provide an important mechanism to give effect to this National Strategy.

KEY ISSUE

The Water Services Development Plan and the associated Integrated Development Plan provide the opportunity to integrate management of the water quality effects of settlements with local government planning and budgeting procedures. (See Sections 5.4 and 5.5).

2.5 What is a settlement

A settlement can refer to any area of human habitation, from single farm dwellings to high-rise blocks of flats. This National Strategy can be used on any of these settlements. However, small settlements, irrespective of how densely populated they may be, do not produce enough waste to have a significant effect on the water resource. (Although localised problems may occur.) Sparse settlements, even if they cover large areas and include a great number of people, are also unlikely to create severe water quality problems, as open spaces allow for the natural breakdown of the waste before it reaches the water environment.


DENSITY PHOTO'S

On the other hand, large densely populated settlements produce more waste in a small area, there is less open space to break down and remove waste, and better services are required to remove the waste for safe disposal. This National Strategy is therefore primarily focussed on addressing pollution from the more densely populated settlements (settlement density > 30 – 40 dwellings per hectare), and poorly serviced settlements.

However, the approaches described are entrenched in co-operative governance with local government. As such the National Strategy is appropriate to address most forms of pollution from this sector. This includes pollution from failing sewage pump stations, as well as overloaded and badly operated Sewage Treatment Works.

2.6 Finding the right balance

Where waste management services are inadequate to safely remove the waste generated in the settlement, or where they are failing, waste can accumulate in the settlement and may be mobilised into nearby surface and ground waters. This is closely associated with the size and density of the settlement. The amount of waste produced in the settlement is also related to its socio-economic status. While wealthier communities produce more waste per household, they can pay for better services to remove and safely dispose of this waste. Poorer communities produce less waste per household, but often cannot afford high levels of service.

Water quality impacts are, however, detected in the receiving environment, and are largely determined by the sensitivity (or Class) of the receiving water resource. The National Strategy to Manage the Water Quality Effects of Settlements aims to identify the appropriate balance between the Resource Class, the amount of waste produced (i.e. size and density), and the level and operation of services. This in turn largely rests on the fulcrum of Financial Sustainability (Figure 2.2).

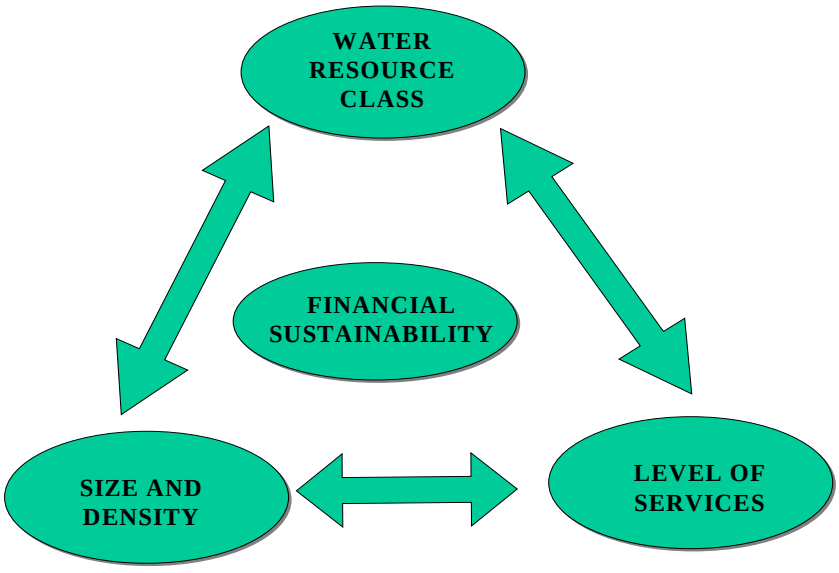


Figure 2.2 This Strategy is aimed at finding the right balance between the Level of Services, the Size and Density of the Settlement, and the Water Resource Class, while still ensuring Financial Sustainability.

2.7 Summary

The National Strategy to Manage the Water Quality Effects of Settlements has been integrated with DWAF,s and the South African government's wider policies towards water resources management and poverty alleviation. These overarching policies provide the framework for the implementation of the Strategy. However, the development of this Strategy has also influenced the ongoing revision of DWAFs policies. This integration and interaction has ensured that the approaches developed here are not only consistent with wider policies, but has also inculcated these approaches within water resources management in South Africa.

The National Strategy therefore outlines the roll out of a participative way of identifying the causes of, and solutions to, pollution within settlements. These aim at reducing or minimising the production of pollutants at source, and aim to provide a balance between the size and density of the settlement, the Class of the receiving resource, and the Level of Services, while still ensuring financial sustainability.

SECTION THREE

THE CAUSES OF POLLUTION FROM SETTLEMENTS

3.1 Introduction

Pollution from settlements is driven by a complex interaction of factors related to both the way in which waste services are supplied and maintained by the service providers, as well as the way they are used and looked after by the community. Effective management of the water quality effects of settlements rests on understanding these causes and their interactions. This helps aim the management actions at the root causes of pollution, which helps ensure sustainable solutions.

This section discusses some of these complexities to provide a basis for the approaches proposed in the National Strategy section of this report.

3.2 What are the underlying causes of pollution in settlements?

Settlements impact on water quality when the waste that is generated as part of the day-to-day activities in the settlement reaches the water resource. This may be sewage waste from failing or non-existent sanitation systems, household refuse and litter (solid waste), or dirty wash water (grey or sullage water). Stormwater, and rainfall runoff, may wash sediment, faecal matter and litter into nearby rivers, which also impacts on the quality of the water resource. Pollution from settlements occurs when there is a *physical* failure of the services in any of these waste streams. (Or sometimes in places where these services don't exist.)

However, *physical* problems tend to be caused by underlying *social* problems, i.e. when the services are not used properly or are vandalised by the community. Similarly *physical* problems may be underlain by *institutional* problems, i.e. when the service provider does not maintain the services properly, or where the services are inappropriate for the community's needs. In most cases pollution in the settlement is caused by the complex interaction of all three of these factors (see Figure 3.1). The water quality impacts of settlements are therefore caused by a combination in the way in which the community uses the waste services, and the way in which they are supplied and maintained by the service providers. Sustainable management of this problem must recognise and address these underlying social and institutional causes.

The approach to identifying these underlying causes of pollution is described in Section 7.2 of this report, and the detailed methodology has been written up in a series of "How To" Guidelines .

KEY ISSUE

Pollution from settlements is caused by the complex interaction of physical, social and institutional factors. All of these underlying causes must be addressed if pollution from settlements is to be effectively managed.

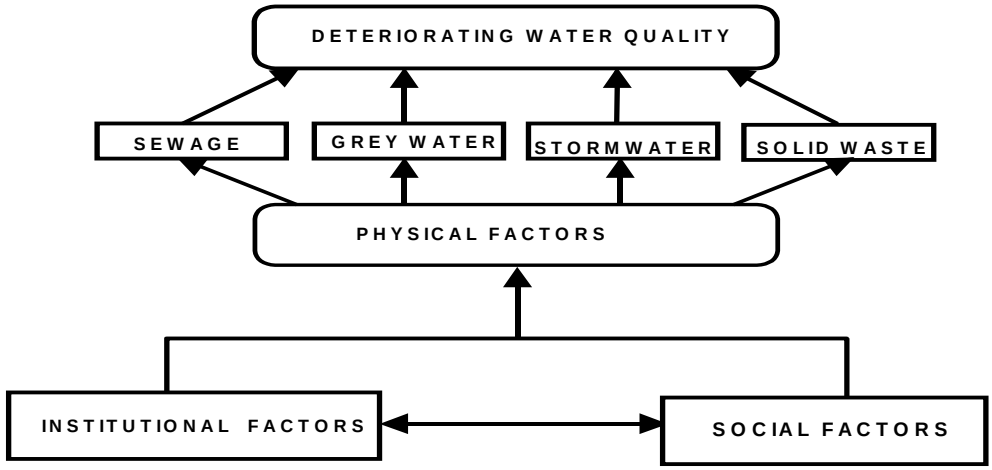


Figure 3.1 The underlying causes of pollution in settlements.

3.3 What role does local government capacity play?

Local government capacity influences the way in which waste removal services are supplied and maintained (i.e. the *institutional* causes). In this sense "local government capacity" includes their legislative instruments (by-laws), organisational capacity, technical capacity (human resources, problem solving capacity, equipment and information systems), financial capacity (i.e. the funds required), procedural capacity (policies, manuals, guidelines, codes of practice), and networking capacity (associations with the community).

A "capacity gap" exists in any case where the capacity required to ensure effective operation and maintenance of the waste services is not matched by the capacity available within the Local Authority. This capacity gap may be financial, where there are no funds to ensure effective operation and maintenance of systems, or may be technical or procedural capacity problems where there are no skilled staff or appropriate procedures in place to ensure the ongoing operation and maintenance of waste removal systems. Similarly, many Local Authorities have very little networking capacity with their communities. This leads to a breakdown in communication, which can contribute to pollution problems.

There are many cases where this capacity gap has resulted in a failure of the waste management systems, and has lead to pollution of the water resource (See Figure 3.2). The report on the Capacity Gap in Local Government outlines these problems in more detail and suggests options for addressing the capacity gap. The Monnakato Test Case focussed on trying to build capacity and networking skills within the Local Authority so that they could manage their waste services better.

A lack of financial resources often lies at the heart of the capacity gap problem. Many Local Authorities in South Africa are facing severe financial difficulties. Local Authorities in financial difficulties tend to reduce spending on operation and maintenance in order to service their increasing debt. Inevitably this leads to a failure of the systems, and hence to increasing pollution problems. In many cases these problems will not emerge immediately, but may only occur 10 to 20 years into the future as poorly maintained systems start to fail. In many cases, current approaches to budgeting and services planning is leading Local Authorities into a debt trap which will take some 7 – 10 years to address, even with appropriate planning in the future. This is primarily due to the fact that most plan to install the highest levels of services without first assessing the affordability of these services. The report on The Financial Component of the Capacity Gap outlines these problems in more detail.

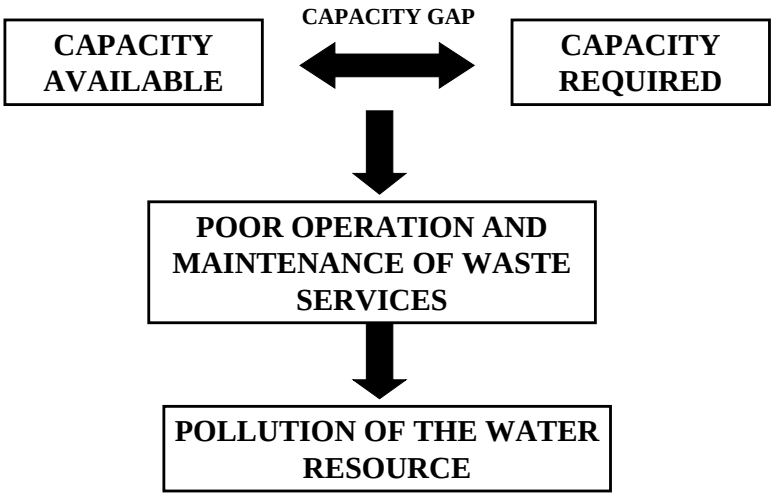


Figure 3.2 The Capacity Gap, and its contribution to pollution from settlements.

A number of local government capacity building programmes are underway in South Africa, which will help close the capacity gap. These programmes have been described in the report on Awareness and Capacity Building, and include those being carried out by DWAF - Water Services, and by the Departments of Local and Provincial Government, and of Land Affairs. The restructuring of local government into larger Local Authorities will also help to reduce the capacity gap by increasing the local tax base, and reducing costs. However, the capacity gap is unlikely to disappear completely - particularly where relatively "healthy" Local Authorities take on a debt and operation and maintenance burden from neighbouring towns, and where there are significant non-payment problems.

KEY ISSUE

The gap between the capacity required to operate waste management services and the capacity available within local government (The Capacity Gap) is likely to remain one of the most significant causes of pollution from settlements.

3.4 What role does the community play?

The community's use, or misuse, of the services contributes to pollution in many settlements (i.e. the *social* causes). Littering and the deliberate dumping of household refuse is rife in most of the poorer communities, in spite of the fact that solid waste removal services have been supplied in many cases. A lack of awareness in some communities also leads to the inappropriate use of the sanitation services. In some settlements the sewer system is used to dispose of solid waste, which causes frequent blockages. In other settlements there is deliberate or unintentional vandalism of the services, for example waste bins that are used for other purposes, or deliberate destruction of sewer piping or toilet systems – often as a form of protest.

In the majority of the cases the community's misuse of the services stems from a lack of awareness, poor maintenance of the waste removal systems (for example broken or unsanitary toilets that are not used by the community), or waste management services that do not meet the community's needs. These problems can be addressed by building awareness in the community of the appropriate use of the services or by building better service provider – consumer relationships.

However, more intractable problems emerge in some cases. These may be related to the use of the sewer systems to hide the evidence of crime – which has been reported to cause significant pollution problems in many settlements, or in some cases vandalism by the disaffected youth. The Kaya Mandi Test Case has demonstrated that where crime and deliberate vandalism are rife, it is difficult to address pollution in a sustainable way.

In some cases the misuse of the services is related to other political or social issues (for example the vandalism of a service to try to secure something better or so that the new leadership can "rebuild" services). In the Social problems are, therefore, closely tied to the wider socio-economic and socio-political problems, which are not easily addressed. South Africa's political history has left a legacy of social problems that are difficult to address. Civil unrest, which was used as a form of protest, together with oppressive attitudes in past local government structures has resulted in a lack of trust and poor communication between communities and service providers – which is often the underlying cause of *social* problems. Communities are also reluctant to accept the *social* causes of pollution, preferring to blame it all on *physical* and *institutional* issues (i.e. communities believe they have been fobbed off with an inadequate system, and the Local Authority doesn't care).

This is sometimes exploited for political gain, and in some Test Cases effective work in identifying the root causes of pollution has been lost when the community is persuaded that their problems are solely due to the type of waste removal system, or the materials used. The Masizakhe and the Phutadijhaba Test Cases are examples of how this can affect implementation of the National Strategy.

A lack of trust in the authorities, and the growing frustration at the perceived slow pace of delivery and poverty alleviation, appears to be deeply rooted in many settlements. This is exacerbated by the political fluidity at local government level, and by the high levels of expectation created by the change to democracy. This situation is somewhat unique to South Africa, and is likely to make it difficult to address social causes of the pollution problem in settlements without clear and unambiguous guidelines from all political levels.

KEY ISSUE

The inappropriate use of waste services is an important cause of pollution in settlements. This usually stems from a lack of awareness of way in which services should be used, but in some cases deliberate vandalism, crime or political opportunism can underlie the misuse of the services. In these cases it is difficult to manage the pollution problem.

3.5 What role does the level of services play?

The level of services influences pollution from settlements in two ways. Higher levels of services, such as full waterborne sewerage or house-to-house collection of refuse, offer greater opportunities to collect and safely dispose of waste generated in the settlement. However, high levels of services come at a greater risk. They are more expensive to operate and, in many cases, the community will not be able to pay for the full operating and maintenance costs of these services. Higher levels of services also require greater organisational and technical capacity within the service provider, and there are greater opportunities for failure, as they require pump stations, sophisticated treatment works or disposal sites and expensive maintenance equipment. In addition, higher levels of sanitation services require that faecal matter be mobilised in water, which increases the risks of it reaching the water resources when the systems fail. The Bethulie Test Case has demonstrated that the risks associated with higher levels of sanitation services can be significantly greater than for lower levels of services.

Lower levels of services, such as VIP latrines and bury and burn options for household refuse, provide fewer opportunities to safely dispose of the waste. Low levels of services may therefore pose some risks to surface and ground -water resources, as the waste cannot be treated to high standards or disposed in a controlled way. However, the risks of failure are significantly lower as they do not require sophisticated treatment or distribution systems. Moreover, there appears to be some debate as to the risks of groundwater contamination posed by VIP latrines, whereas the threats posed by untreated sewage, both within the settlement and in the water resource, are clear.

The Grahamstown/Rini Test Case has shown that the incidence of diarrhoea is highest in areas supplied with bucket sanitation systems, but areas with failing higher levels of services also show a high incidence of diarrhoea. (See Table 3.1 in the report on the Economic Costs of Pollution in two Towns). In this case VIP systems tend to provide greater levels of protection than the failing waterborne systems, and are cheaper to maintain. If the Local Authority opted to install VIP systems in all future developments as opposed to full waterborne systems - the savings on disease treatment costs and on operation and maintenance would place them in a better position to maintain the existing services.

KEY ISSUE

Higher levels of services increase the risk of a capacity gap problem. As faecal matter is mobilised in water severe pollution problems emerge when these services fail. The biggest regional threats to water quality therefore come from failing higher levels of services.

However, there are political and social pressures to install higher levels of services, irrespective of the capacity to manage these systems. Most communities understandably push for the highest levels of services, often irrespective of their ability to pay for these services. Any work with the community to highlight the financial constraints with their choice services is also easily subverted for political gain. More importantly, a number of Local Authorities have already installed high levels of services, or have made promises to install high levels of services. This problem is likely to get worse as the frustrations regarding the perceived lack of delivery grow.

The restructuring of local government may partly address this problem by increasing the opportunities for cross subsidisation to allow for higher levels of services. However, many of the new Local Authorities are still unlikely to have the capacity (in all its forms) to supply the highest levels of waste services to all. This will be particularly true for those Local Authorities with a high proportion of poor households on higher levels of services (See Section 4.6). Unfortunately, the apparent greater capacity following amalgamation of Local Authorities in December 2000 may encourage widespread installation of the highest levels of services. If these current trends to install the highest levels of services in places with little capacity to manage these systems continue, severe pollution and community health problems will emerge if these systems start to fail.

KEY ISSUE

Sustainable management of the water quality effects of settlements requires clear unambiguous statements regarding appropriate levels of services, particularly where affordability is low.

3.6 What is the role of non-payment?

Non-payment for services, which in many cases started as a form of political protest, is still pervasive in many Local Authorities in South Africa. This robs the Local Authority of capacity, and as such contributes to the pollution problem. Most of the settlements studied as part of the "Dense Settlements" project have non-payment rates of between 30 and 60%. This limits the income to the Local Authority, who then curtail spending on operation and maintenance of the services, particularly in the areas where non-payment is widespread.

The opportunities for addressing the non-payment problem are largely related to the "can't pay" or "won't pay" issues. Where high levels of services have been installed the opportunities for adequate cost recovery are lower. However, most households can contribute to the costs of these services, and in most towns even partial cost recovery would make significant inroads into addressing the pollution problem. The major problem, therefore, seems to be related to a complete lack of payment in many households – especially in those households with some income.

It is notable that the Masekhane campaign seems to meet with limited success, and in some cases payment has actually decreased following the Masekhane campaign. In other cases, initial improvements in payment were reversed once active interaction with the communities stopped. In other cases the non-payment problem has been exacerbated by the announcements that basic services would be provided free to the poor. Unfortunately, because of the history of apartheid, most disadvantaged people consider themselves to be poor, often in spite of the fact that they have some income.

The non-payment problem is therefore deeply rooted in South Africa, and is a consequence of a long history of suppression, deprivation and dependency. Be this as it may, there have been a number of successful campaigns for services payment. However, in many cases local politicians and officials are unwilling to take the hard decisions required to sustain these campaigns. Active intervention is also necessary to break the cycle of “Give us better services and we will pay” – “Pay and we will be able to give better services”. These issues are discussed in more detail in the report “An Assessment of the Non-payment Problem”.

KEY ISSUE

Non-payment robs local government of capacity and hence contributes to the pollution problem. While some households cannot afford to pay for the full operating and maintenance costs of services, most households can contribute to the costs of waste management services. The non-payment problem must therefore, be addressed by clear guidelines regarding payment for services in poor households.

3.7 What is the role of local government budgeting?

Many of the institutional causes of pollution are associated with the resources allocated to operation and maintenance of the waste management services. While, the percentage of the budget required for maintenance differs according to level of services provided, the Institute of Municipal Finances Office has indicated a general guideline of 10% of the total budget should be spent on repairs and maintenance and some 27% on salaries (See Table 2 in the report “The Financial Component of the Capacity Gap”). The highest proportion of spending on O&M encountered in this study has been 6.5%, with the many municipalities spending less than 5% on this item. More importantly, this budget item seems to be growing slower than the inflation rate. This effectively means less and less is available for effective maintenance of the services. Local Authorities are hesitant to make decisions to curtail spending on salaries by cutting back on staff, or by limiting salary increases.

Local government budgeting is also tied to their Integrated Development Plans, and hence to their Water Services Development Plans. In this respect, Local Authorities must make a budget available to address the issues and development objectives raised in their IDP and WSDP. As such, plans to address the ongoing pollution problems must be integrated with the WSDP and IDP, if they are to secure sufficient funds in the future. However, to date little attention has been focussed on ensuring sufficient funds for operation and maintenance specifically where this is intended to address pollution problems. The Monnakato Test Case provides a good example of how the funds required for managing waste services can be integrated into the local government budgeting process.

The Departments of Provincial and Local Government, and of Finance have programmes aimed at building capacity within local government – particularly with respect to the links with the IDP and the budgeting process. However, given the history of poor budgeting, and the lack of clear incentives to ensure sufficient budget for O&M, these programmes are unlikely to result in a rapid turn around in spending on maintenance. Poor budgeting is therefore likely to continue to contribute to the pollution problem into the future. However, in spite of the somewhat pessimistic picture outlined above, recent indications are that local government structures are paying more attention to appropriate budgeting.

KEY ISSUE

The local government budgeting process determines the resources that are made available for operation and maintenance and hence can contribute to pollution. Actions aimed at addressing pollution problems must, therefore, be included in the Integrated Development Planning process, and hence into the local government budgeting process.

3.8 What is the role of women?

In many areas (and especially the rural areas) women and children are primarily responsible for the cleanliness of the household, for disposal of household refuse, and do most of the washing. As such women are primarily involved in the polluting activities, and are normally best placed to identify polluting behaviour in the community. However, in the more urban settlements (which pose the greatest water quality threats) this more traditional role for women is less prevalent, and men often take on household cleaning chores.

Nevertheless, community interaction in the Test Cases has shown that women accept the dual responsibilities of both social and institutional causes of pollution better than the men. Their involvement in identifying the social causes of pollution is therefore critical. Moreover, women as the primary care givers, more readily see the health benefits to changed behaviour, and are better placed to influence the children. As such women often provide the drive necessary to give effect to awareness campaigns, and campaigns to change polluting behaviour in the settlement.

KEY ISSUE

Women more readily accept that both social and institutional problems contribute to pollution, and they are therefore critical to the process of finding the root causes of pollution. Women are also most affected by the pollution problem, and are therefore an important part of ongoing awareness campaigns.

3.9 What is the role of environmental factors?

A number of environmental factors increase the risks of pollution in settlements. The most important of these are slopes, soil types, proximity to the water resources and rainfall.

Rainfall runoff is higher in settlements on steep slopes. Waste generated in settlements on steep slopes is therefore more likely to be carried to the water resource once it rains. Similarly the levels of services can become important on steep slopes. Unpaved roads on steep slopes erode soils into the rivers, and faecal material in pit latrines on steep slopes may "surface" further down the slope.

Soil type is important with respect to the impact on groundwater resource. Waste deposited in or on sandy soils is more likely to infiltrate the soil and pollute the groundwater. For this reason unlined pit latrines or on site wet sanitation systems should be avoided in areas with sandy soils or in dolomitic areas, particularly if the groundwater is used for domestic supply.

Settlements placed close to rivers, or in areas where the groundwater table is shallow, are also more likely to pollute the resource. Large dense settlements placed close to rivers also impact on aquatic habitats, as houses start to encroach into the riparian zone. The class of the receiving water resource is also important in this respect. Settlements placed close to sensitive water resources are more likely to have significant water quality impacts.

High rainfall increases the risks of waste generated in the settlement being washed into nearby rivers, and to the groundwater, but also increases the number of small rivers and streams running through the settlement. Erosion of roads is also a greater problem in high rainfall areas, and on site sanitation systems can flood in heavy rains.

The interaction between these environmental factors and settlement pollution is largely related to the way in which waste services and settlement layout are planned, and the report on Planning to Avoid Pollution outlines some of these concerns in more detail. A recent Water Research Commission study has also developed a PC based planning and reporting aid to guide the installation of appropriate levels of services (Howard *et al*, 2000).

KEY ISSUE

Environmental factors like slopes, proximity to the water resource and soil types affect the impact of settlements on the water resource. These issues must be addressed when new settlements are being planned.

3.10 What is the role of poverty?

A number of issues affect the ability to local government to supply and maintain waste management services, and influence the community's use of these services. However, these problems are interdependent, and are all part of the ongoing cycle of poverty. For example, where high levels of service have been supplied, the lack of capacity to effectively maintain these services often leads to the failure of services (*institutional* causes). This is exacerbated by *social* causes such as non-payment, inappropriate use of the system, or vandalism of the services. These social causes are all closely linked to poverty. Poor communities not only struggle to afford to pay the full operation and maintenance costs of higher levels of services, but a lack of awareness and poor education also contributes to the misuse of services. The unemployed youth are also more likely to vandalise services.

A polluted environment also demoralises the community and encourages further pollution, or limits the effectiveness of those services which are provided, e.g. where litter blocks sewer lines, or where overflowing skips prevent people from safely disposing of household refuse. Where large amounts of waste are left in the settlement, the community is less likely to take care when disposing of waste, to pay for services, and to report breakdowns in service provision. This increases the resources required to maintain the services and robs the service provider of capacity. This eventually leads to serious health effects for the community, and for downstream users (see Figure 3.3). The additional demands on the local health care system further drain local resources and increase the capacity gap (see the report on External costs of Pollution in Two Towns).

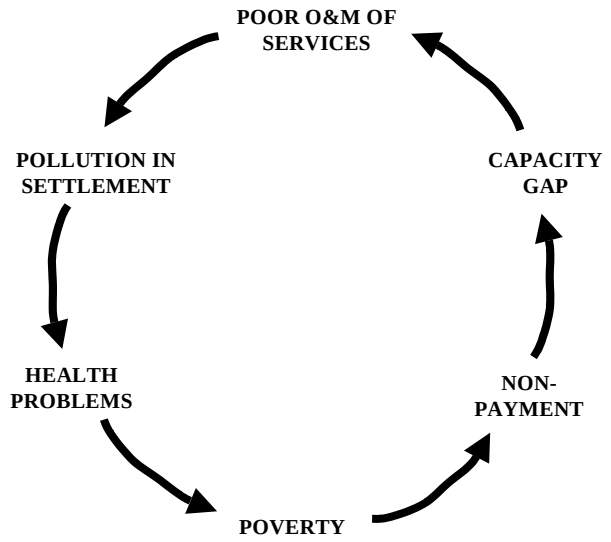


Figure 3.3 The Cycle of Poverty and Pollution, showing how poverty, pollution, the Capacity Gap, and community health are interlinked.

KEY ISSUE

Poverty contributes to pollution by reducing community pride, and by contributing to the non-payment problem. This results in a cycle of pollution and poverty that can often only be addressed by financial support from outside the settlement.

3.11 Conclusions

The variety of factors underlying pollution from settlements are highly inter-dependent and a holistic approach to identifying and addressing these problems is required. The combination of factors contributing to pollution in any settlement is also unique and a settlement-specific approach to identifying and addressing these is critical. More significantly, community and local government involvement in this process is important as this builds a common understanding of the causes of the problems, and leads to more sustainable solutions.

While, the preceding sections have painted a rather pessimistic picture of our ability to manage the complexity of factors leading to pollution from settlements, the Test Cases have indicated that it is possible to identify and address the root causes of pollution. But, the mandates to address the all the contributing factors lie with communities, local, provincial and national government. Sustainable solutions therefore lie in better interaction and co-operation between local, provincial and national government as well as with communities.

SECTION FOUR

WHAT ARE THE "COSTS" OF POLLUTION FROM SETTLEMENTS?

4.1 What "costs" are associated with pollution from settlements?

Pollution in settlements not only affects water quality and hence downstream users, but also impacts on the community itself. The implications or "costs" of pollution from dense settlements are therefore wide ranging, and include health costs, social costs, environmental and downstream user costs (see Figure 4.1). This section outlines these "costs", both in financial terms as well as in descriptions its social and environmental impacts. This is intended to make compelling arguments for communities and all spheres of government to invest resources in addressing this problem.

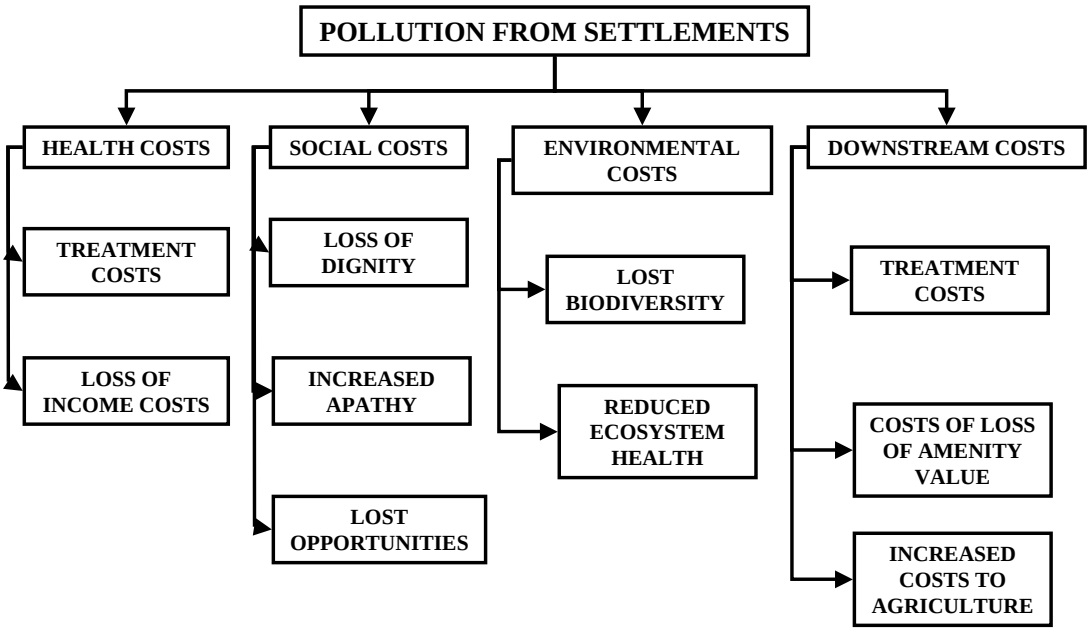


Figure 4.1 The "costs" of pollution in and from settlements.

4.2 What are the health "costs"?

The most important impacts of pollution from settlements occur within the community itself. Failing sanitation systems increase the risks of direct contact with faecally contaminated effluent in the settlement, or from transmission of faecal material by insects which breed in solid waste left in the settlement. The risks associated with poor hygiene practices are also much greater in polluted settlements, as the community is more likely to come into contact with faecally polluted material.

The World Health Organisation has estimated that, world-wide, pollution associated with failing or non-existent sanitation systems, the subsequent contamination of water supplies, and poor hygiene practices are responsible for up to 11 000 deaths per day. In South Africa as many as 43 000 deaths per year have been attributed to these problems, and the recent cholera epidemic ravaging many of our poorest communities is a graphic reminder of the consequences of ignoring this problem. This

study has shown that in South Africa, as many as 14 million diarrhoea cases per annum can be associated with a lack of adequate sanitation, while up to 1.5 million cases could be associated with failing sanitation systems.

These diseases hold financial and economic costs for national, provincial and local government, both in terms of direct treatment costs as well as indirect costs associated with a loss of productivity. These costs can be calculated by using diarrhoea incidence rates from Pegram, Rollins and Espey (1998), and the national Census data. Using these sources the direct costs of diarrhoea in settlements with failing services have been calculated at R 150 million per annum, while the costs of treating diarrhoea in settlements without sanitation are some R 2 billion per annum. Much of this cost is due to the fact that some 14 million people in South Africa still do not have adequate sanitation (data from the '96 Census). Some 8 million poor people (defined as an income of less than R 1000/m/household) live in settlements with high levels of sanitation services. In many of these cases the "Capacity Gap" problem is likely to lead to failing sanitation services.

In many cases the costs to the Local Authority of treating diarrhoeal disease makes up a significant proportion of their spending on operation and maintenance. Some 5 to 10 % of the direct costs of treating diarrhoeal diseases are borne by the Local Authority (who provide clinics, basic medicines and pay health care workers), some 30-35% by Provincial Government (who provide medicines, and cover hospital care), and 60-65% by the poor themselves (who bear some of the costs of clinic visits, medicines and the lost income due to time off as caregivers).

In Grahamstown, the direct financial burden of diarrhoea is R 1.3 million per year, most of which is borne by the provincial government, while in Stellenbosch this figure is as R 800 000.00 mostly because few households are on bucket systems in Stellenbosch. However, the direct costs to the poor in both towns can be in the range of R100-R200 per household per year. In these cases, investing these costs in prevention rather than cure activities (i.e. to maintain the sanitation systems) can make a significant difference to the lives of the poor.

KEY ISSUE

Pollution in settlements increases the risks of children coming into contact with faecally contaminated water, and increases disease vectors like flies. Pollution also contributes to poor hygiene practices by demoralising the community. Together these problems hold enormous costs for all spheres of government, as well as for the poor themselves.

4.3 What are the environmental "costs"?

The environmental costs of pollution from settlements are difficult to calculate in financial terms. But as a signatory to Agenda 21, South Africa has a special obligation to protect biodiversity. Biomonitoring has shown that there is a drop in invertebrate diversity immediately downstream of polluting settlements. In some cases pollution from failing sanitation systems has depleted oxygen in short stretches of river. This can create a "plug" in the river preventing the migration of fish for breeding. World-wide increasing urbanisation and the associated non-point source pollution from settlements is recognised as a major cause of a loss of diversity in nearby rivers (Serageldin, 1994).

4.4 What are social "costs"?

The social costs to pollution lie primarily in the perpetuation of the poverty cycle. Diseases associated with pollution in settlements keep children from school, robbing them of development opportunities. Similarly adults may be prevented from going to work, either as caregivers or by being ill themselves. In many settlements sanitation services are shared, further increasing the

indignity and threats of diarrhoea. In one settlement, people interviewed thought that diarrhoea was a "normal" condition. People living in polluted settlements are often demoralised, and are more likely to pollute their environment or to vandalise services. The Kaya Mandi and Grahamstown Test Cases are good examples of how pollution can have widespread social impacts on the community.

In some settlements provided with flushing toilet systems, virtually every toilet and manhole cover may be blocked, and raw sewage flows through the streets. These settlements are unsightly, smelly, and pose a serious health risk to children. Communities in these settlements have little pride in their area, which not only promotes further pollution, but makes it difficult to get any community upliftment projects off the ground. The Kliptown Test Case has shown that the investment in addressing the pollution issues seems to have served as a catalyst for many other projects, all of which contribute to better living conditions in the settlement.

KEY ISSUE

Pollution within settlements contributes to the cycle of pollution and poverty, and robs the community of development opportunities. This will slow South Africa's evolution into a democratic and equal society.

4.5 What are the downstream "costs"?

The downstream costs of pollution from settlements are primarily associated with eutrophication of drinking or recreational waters. Eutrophication increases the costs of treating water to potable standards, and may also result in algal blooms that are toxic to both humans and livestock. While it is difficult to estimate how much of the eutrophication problem is due to dense settlements pollution, tentative estimates can be made from catchments dominated by dense settlements.

Bulk water treatment authorities in catchments that include a significant number of densely populated and poorly serviced settlements[3] report that the *increases* in treatment costs due to eutrophication are as high as R1 per megaliter of water. After making allowances for the proportion of the problem due to point sources and agriculture, the total increases in treatment costs across South Africa has been estimated at R 64 million per annum

There is also growing concern due to the loss of amenity and tourism value in many areas. The Hartbeespoort Dam catchment forum reports that development of the tourism potential of the lake has been severely hampered by eutrophication, with significant economic impacts for the area. Bruwer (1979) has indicated that the loss of property and amenity value associated with eutrophication can be significant.

KEY ISSUE

Pollution from settlements contributes to eutrophication of downstream waters. The increased treatment cost as well as the loss of amenity value in these areas runs to millions of Rand per year.

[3] This includes Umgeni Water's Wiggens works, East London Municipality, Rand Water's abstraction from the Vaal Barrage, and Magalies Water's abstraction from Hartbeespoort.

4.6 How widespread is the problem?

It is difficult to estimate the number of settlements with pollution problems. However, it is possible to estimate the number of Local Authorities that may not be able to recover the costs of their services from the local tax base. In cases where higher levels of services have been installed in poor areas (or are planned to be installed), Local Authorities are often not able to recover the operation and maintenance costs of these services without reviewing their billing systems. Current billing practices in many Local Authorities do not allow for sufficient funds to be recovered from the wealthier sectors to cover the costs of higher levels of services to the poor. As a result of this many Local Authorities are increasing the costs of water and electricity, and/or are introducing "rising block" water tariffs. Many are also increasing local taxation to help cover the increased costs of higher levels of services to the poor.

While this form of cross subsidisation helps close the capacity gap, and can help reduce pollution, this kind of intervention is only viable in Local Authorities that have a higher proportion of wealthy consumers, and a lower proportion of poor households on high levels of services (HLOS). Many Local Authorities are therefore caught in a "debt trap", where they will be unable to effectively operate and maintain their waste services even if they are able to address their non-payment problem. It is possible to estimate the national extent of this problem from Census data showing the proportion of poor households that have higher levels of services.

The table and figure below show the proportion of households in the Local Authority area that are both poor and have high levels of services. Local Authorities in the > 30% category are unlikely to be able to recover the costs of their services from rates and taxes levied at a local level. Those in the 20-30% bracket may suffer capacity gap problems, while those in the <20% bracket are more likely to be able to raise sufficient taxes locally to address their problems.

Table 4.1 The percentage of Local Authorities in each province with differing proportions of poor households (household income < R 1000/m) on high levels of services. (based on the old demarcation)

Provinces	No. of L.A.	% of poor households with HLOS		
		<20%	20%-30%	>30%
Eastern Cape	177	79.66	9.6	10.73
Free State	98	55.1	14.29	30.61
Gauteng	45	22.22	66.66	11.11
KwaZulu-Natal	74	41.89	33.78	24.32
Mpumalanga	80	55	18.75	26.25
North West	52	53.85	28.85	17.31
Northern Cape	114	47.37	35.09	17.54
Northern Province	49	77.55	14.29	8.16
Western Cape	126	42.86	42.06	15.08

KEY ISSUE

Many Local Authorities in South Africa will be unable to raise sufficient revenue to effectively operate and maintain their services from the local tax base. In these areas ongoing pollution and the associated external costs may further hamper growth.

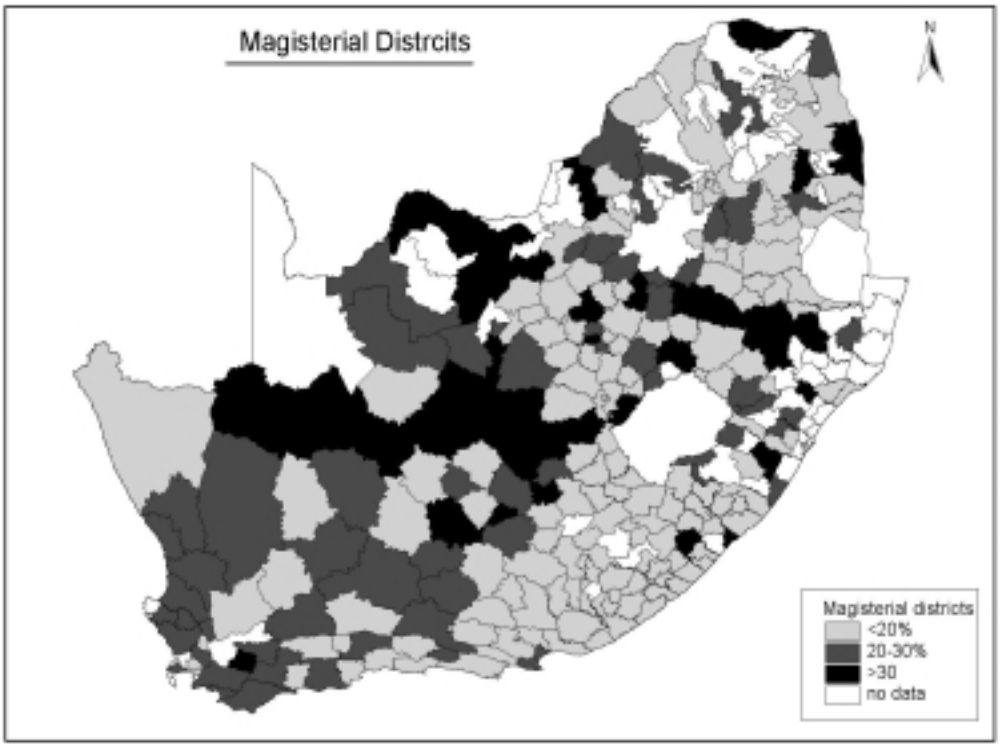


Figure 4.2 A map of magisterial districts in South Africa with differing proportions of poor households on HLOS (based on the new demarcation).

4.7 Conclusions

The most urgent need is to supply at least the basic sanitation services to some 14 million people who at this point have no services. (This will address the pollution problems associated with bush toiletting or bucket latrine systems, and will reduce the incidence and costs of diarrhoeal diseases.) However, the greatest water quality problems associated with dense settlement pollution seem to be associated with failing higher levels of sanitation services.

Pollution from these failing sanitation and waste systems has a significant impact on South Africa, both in direct financial costs, but also in social and environmental costs. This makes compelling arguments to ensure that these services are effectively maintained. However, Local Authorities with a high proportion of their households that are both poor and have high levels of services are unlikely to be able to recover sufficient funds to effectively maintain and operate their waste management services. This problem is already widespread in South Africa, and may increase as demands for the highest levels of services continue to grow. This will increase the risks of pollution in these towns, unless mechanisms are put in place to close the capacity gap in the short term.

More importantly the costs of pollution are borne by all three spheres of government. This makes compelling arguments for all three spheres of government to commit financing resources to addressing this problem. Section 6 of this report outlines financing options within all three spheres of government that could be used to start addressing this problem. But more significantly, the poor perhaps bear the greatest “costs” of pollution both in direct financial burdens, but also in indirect social costs. While it is clear that the poor cannot bear the full costs of managing pollution in their settlements, their contribution would make significant inroads into addressing the problem, and would ultimately be to their benefit.

SECTION FIVE

LEGAL CONSIDERATIONS FOR MANAGING POLLUTION FROM SETTLEMENTS

5.1 Introduction

The management of pollution in and from settlements must ensure that there is both a mandate and supporting legislation for intervention. However, the root causes of pollution from settlements lie in activities across all three spheres of government. If management is to be aimed at these root causes, it must seek to influence all these activities. This makes the legislative environment around managing the water quality effects of settlements highly complex, and provisions in the Constitution, National Water Act, the Water Services Act and the Local Government: Municipal Systems Act can be used to support the rollout of the National Strategy. These provisions are discussed below.

5.2 The Constitution (Act 108 of 1996)

Much of the problem of pollution in and from settlements occurs due to the way in which services are supplied and used. The Constitution delegates the responsibilities for servicing (and pollution management) to local government. This raises the issue of what level of control can National government (in this case DWAF) exercise over what services are supplied, how these are maintained and how they are used. The answer to this lies primarily in the distinction between legislative and executive powers as outlined in the Constitution.

The Constitution, by not listing water resource protection in Schedule 5, gives national government the mandate to legislate measures to protect the water resource. However, the executive power with respect to services provision lies with local government. Local government must, therefore provide for at least the basic services, but national government can legislate *how* these duties should be carried out in order to protect the water resource. The Constitution does, however, specify how national government should intervene when local government fails to perform its executive duties in such a way as to cause deterioration of the water resource. In this respect national government may only intervene in the affairs of provincial government, and provincial government in turn in the affairs of local government[4].

As such, while national government can provide guidelines and minimum standards for services provision to ensure both basic human needs and the protection of the water resource, it may not intervene to actually provide these services, unless this is done via the province concerned.

The Constitution also places special obligations for co-operative governance between all spheres of government. Legal action or the intervention in the executive powers of other spheres of government should therefore be seen as a last resort. The approach towards identifying and addressing pollution from settlements must therefore be based on cooperative governance approaches, whereby DWAF or the CMA can help local government identify and address the root causes of pollution from settlements.

[4] There is currently an initiative to rewrite parts of the Constitution to give national government greater say of local government. However, this still requires significant debate and stakeholder participation before it can be finalised.

More details on the provisions in the Constitution with respect to the delegations of powers, and the implications for pollution management can be found in the report on the Legal Considerations for managing the water quality effects of settlements.

5.3 The National Water Act (Act 36 of 1998)

The National Water Act contains a number of provisions that could be used to regulate the way in which local government exercises its powers with respect to activities that may pollute the water resource.

- Section 19 makes provision for DWAF to issue a Directive to local government providing services that are causing, or which may cause pollution, to commence interventions to rectify the problem. The Department or the CMA may undertake pollution control measures, and then recover the costs of these from the polluter.
- Section 20 makes provision for a Regional Director within DWAF to issue a Directive to local government to commence interventions under emergency conditions. Here too the Department may undertake pollution control measures, and then recover the costs of these from the polluter.
- Sections 26 (1) (a) and (g) provide for Regulations that may prohibit the planning, siting or establishment of waste management services under certain conditions.
- Section 38 (1) makes provision for declaring waste management services or siting of settlements as "Controlled Activities" under certain circumstances. These will require authorisation before they can be carried out. Certain conditions may be attached to this authorisation that could specify minimum operation and maintenance requirements for these activities.
- Sections 27 to 31 make provision for the "general authorisation" of certain waste disposal practices for example septic tanks.

The simplest way to ensure national uniformity and clear guidelines with respect to managing pollution from densely populated settlements would be to establish regulations for minimum standards. However, while there are common factors leading to pollution from settlements, the underlying root causes of pollution tend to be unique to the settlement. Moreover, many of these underlying causes are due to the misuse of the waste management systems. This makes it difficult to specify nationally applicable norms and standards to address pollution from settlements. Moreover, the history of interaction between local government and water quality management staff shows that it would be difficult to enforce these standards.

In addition, many of the provisions in the National Water Act rely on the wording "is responsible for" pollution, or "in control of" with respect to controlling activities that lead to pollution. It is a moot point as to whether local government is responsible for services failures, particularly where social problems contribute to the pollution, and where the pollution emanates from illegally occupied land. This is likely to make it even more difficult to successfully prosecute Local Authorities in these cases. More importantly, interaction with the community in these cases may also be seen as legitimising the occupation of the land. In these cases any form of intervention would have to be carefully considered.

The structured dialogue process adopted for this study therefore relies on site-specific identification of the root causes of pollution in cooperation with the Local Authority, the service providers and community. Cooperative agreements can then be made to bind all the parties to the agreed set of interventions. However, DWAF or the CMA may also wish to further formalise these agreements as "Directives" under certain circumstances. These may be issued under Section 19 or Section 20, depending on the urgency of the interventions. It may also be necessary to

further formalise this process as an "Agreed Procedure" with local government, as is provided for in the Constitution.

> The Guidelines for WQM outline the steps that should be followed when DWAF regional staff wish to address pollution from settlements using these tools, while more details on the provisions in the National Water Act can be found in the report on the Legal Considerations for managing the water quality effects of settlements.

5.4 The Water Services Act (Act 108 of 1997)

The Water Services Act aims at local government as Water Service Providers and is intended to outline a programme of providing environmentally and financially sustainable water services to at a local government level. This has also been much of the focus of the previous sections of this report. This makes the Water Services Act a valuable tool to address many of the issues raised in this document, and in particular to ensure that the services planning process considers the potential pollution impacts of the proposed services.

The Water Services Act makes provision for both financially and environmentally sustainable water services provision, by requiring Water Service Providers to develop Water Services Development Plans (WSDP) (See Sections 12 to 15 of the Act). These Plans should emphasise the need to protect water quality, but also for financially sustainable water services provision. As such, these WSDPs together with the ongoing support to local government to develop their plans, should address most of the concerns outlined in Section 3. In this respect, the Strategy to Manage the Water Quality Effects of Settlements must be fully integrated with water services planning process. Options to ensure this process are outlined in Section 7.

Section 63 of the Water Services Act also provides for intervention by the Minister of Water Affairs and Forestry in local government, via the Council of Provinces, where Service Providers have not met their obligations in terms of the Act. These provisions also provide the means to intervene with respect to pollution from these areas. Unfortunately, the Water Services Act only addresses sanitation and water supply services, and therefore cannot address stormwater or solid waste pollution problems, and in these cases the water quality impacts will have to be addressed under the National Water Act. However, in these cases DWAF may also call on the provincial legislature to intervene with local government in terms of Section 139 of the Constitution, where local government is not carrying out its obligations to manage pollution from stormwater and solid waste services.

5.5 The Local Government: Municipal Systems Act (Act 117 of 1998)

The Local Government: Municipal Systems Act is intended to give effect to South Africa's vision of "developmental local government" by promoting a bottom up process of driving development. The primary focus of this Act is therefore on local government's internal systems and administration. However, the Act also provides the framework for integrating the various sectoral planning requirements into a single Integrated Development Plan (IDP).

Municipalities are required to produce and annually review their IDPs, but more importantly must give effect to its IDP, and must conduct its affairs according to this IDP. The Integrated Development Plan must *inter alia*:-

- link, integrate and co-ordinate plans, schemes and proposals for the development of the municipality;
- align the resources and capacity of the municipality for the implementation of the plan;
- form the policy framework and general basis on which annual budgets must be based; and
- be compatible with national and provincial development planning requirements binding on the municipality in terms of legislation.

The Department of Provincial and Local Government is currently investing significant resources into capacity building within local government with respect to the Integrated Development Planning process. This Act therefore provides the mechanisms necessary to entrench the principles of this Strategy within local government functioning within South Africa. More details on the provisions in the Local Government: Municipal Systems Act can be found in the report on the Legal Considerations for managing the water quality effects of settlements.

5.6 Conclusions

The Department of Water Affairs and Forestry has the Constitutional mandate to legislate measures to protect the water resource. In this respect this Department can assist local government to identify the root causes of pollution in settlements and can indicate how the waste services should be provided in order to protect the water resource. A number of pieces of legislation can be used to support this.

Given the site-specific nature of many of the problems, Directives under the National Water Act provide the means to specifically direct management at the root causes of pollution. These provisions allow DWAF regional or Catchment Management Agency staff to intervene in cases where there are existing threats to the water resource (i.e. for reactive or rehabilitative interventions – see Section 7.2).

Proactive interventions (i.e. ensuring that there is sufficient capacity for O&M of services and integration with the planning process) should be supported by provisions in the Water Services Act, and in the Local Government: Municipal Systems Act. This will also ensure that the recommendations are fully integrated with the municipal planning and budgeting process.

KEY ISSUES

The National Water Act provides the means to intervene in cases where there are existing water quality problems due to pollution from settlements. The Water Services Act and the Local Government: Municipal Systems Act provide the means to integrate the recommendations of this Strategy with the municipal planning and budgeting processes.

SECTION SIX

FINANCING INTERVENTIONS

6.1 Introduction

The previous sections have emphasised that much of the pollution problem is associated with the financial status of local government. The Test Cases have shown that in many cases the social and institutional causes of pollution are relatively cheap to address. However, in most cases the backlog in services and maintenance has left significant physical problems, for example where misuse of sewers systems, associated with a lack of maintenance has meant that the sewer system is effectively non-functional. In most cases, interventions to address these physical problems will require a significant injection of funds (In the Test Cases, addressing the physical problems used up most of the budget.) The paradox arises that Local Authorities most in need of interventions to address pollution, are often not in a position to afford the interventions from their own budget.

However, significant resources are being directed from national to local government to ensure the provision of basic services and housing. In most cases, the provision of these funds is also tied to providing financially and environmentally sustainable services. This provides an opportunity for Local Authorities to tap into these resources to help fund the physical interventions. This section provides a brief introduction to the possible sources of this funding, and where these resources could be used to fund interventions under the Strategy.

6.2 National policies

National government is keenly aware of the need to improve the quality of life for people living in poorly serviced settlements, but also of the limited funds to address the backlogs in services left by the previous regime. Government Departments have consequently made a number of investment vehicles available to address financing of the planning, upgrading and servicing of settlements. But they have, through the Municipal Infrastructure Investment Unit (MIIU) and Fund (MIIF), established several key policy principles that will affect the use of these funds. These are:-

- Government should not set national standards higher than the basic RDP levels.
- Local Authorities should be encouraged to adopt shorter-term goals of universal coverage to these basic levels.
- Grant financing for these levels should be limited to *once-off capital* for on site infrastructure. Only modest amounts for bulk infrastructure should be supplied, and only where the supplier cannot afford even a basic level of services from own sources.
- Consumers should be able to demand services above these RDP levels, provided that they pay for the full costs of the services.
- Consumers should pay the full recurrent costs of services within the Local Authority area, and there should be no operation and maintenance subsidy entering an area from outside[5].
- The tariff structure for water and sanitation should include a lifeline tariff, plus a rising block tariff that increases with consumption.

[5] The provisions for "free basic water" effectively contradict this principle in that Local Authorities are encouraged to use the Equitable Share grant to help cover the costs of providing the first 6000L of water "free" to the poor.

This makes it clear that RDP levels are considered the basis, and anything above this level is regarded as a community desire, and must be paid for by the community. More importantly, O&M costs will not be supported from outside the Local Authority area of jurisdiction. These principles must also underlie use of these funds to address the physical causes of pollution.

6.3 Potential sources of funds for interventions

A number of funding sources are aimed at different aspects of the planning, development, upgrading and servicing of settlements. While these sources are not specifically intended for financing physical interventions under this Strategy, in many cases they can provide the funds required for the physical intervention. These sources are described below.

6.3.1 Consolidated Municipal Infrastructure Programme

The Consolidated Municipal Infrastructure Programme (CMIP) integrates a number of short-term grant-funding programmes that were administered by a number of departments, into a single programme under the auspices of the Department of Provincial and Local Government. CMIP is designed to further the aims of the RDP through the provision of funds for labour intensive projects to provide bulk infrastructure. These grants can be used for new schemes, upgrading of existing bulk services schemes, and the rehabilitation of existing schemes. This includes the use of CMIP funds to install VIP sanitation systems. The principle of CMIP is that the full capital cost of a basic level of service (up to R 3000 per household) should be subsidised by the national budget, and that additional costs should be carried at a local level.

CMIP grants can also be used to leverage additional funds. Used together with the housing subsidy funds (described below), CMIP funds provide a valuable source of funds to implement the levels of service recommended by this Strategy. In addition to this the Department of Provincial and Local Government has also made an addition 5% of the CMIP grant available, to be used to support operation and maintenance of services installed using CMIP funds.

KEY ISSUE

CMIP grants are useful to address the physical causes of pollution where these are related to a lack of services, or where the existing services have not been installed with a CMIP grant. CMIP grants can also be used to upgrade services where the pollution problems have been caused by the capacity of the waste services being exceeded.

6.3.2 Home owner subsidies

The Housing Subsidy Scheme is intended to allow the poor to acquire affordable residential property, with secure tenure, and to ensure minimum health and safety standards. These subsidies are linked to income so the poorest receive the greatest benefit (Table 6.1).

Table 6.1 The subsidy amounts available for different income levels.

Monthly household income	Subsidy amount
R0-R1 500	R 15 000
R1 501-R2 500	R 9 500
R2 501-R3500	R 5 000

The Housing Subsidy Scheme is primarily intended for the rapid provision of low-income housing. It could, nevertheless, be argued that to ensure basic health and safety standards, some of the subsidy should be used to supply services that limit pollution of the environment. As such, some of the subsidy should be used to provide sanitation services. Communities with no sanitation services could therefore tap into these funds to provide for both housing and basic sanitation services.

The Housing Subsidy Scheme also makes provision for higher subsidies where the soil conditions would require more extensive foundations for the houses. This provides the opportunity to influence the housing subsidy policy to recognise that higher subsidies may be required where the receiving water environment is particularly sensitive (for example to ensure that VIPs are lined). The Housing Subsidy Scheme is therefore best suited to new developments where there is a need to influence the level of services to ensure the protection of the water resource or in areas where the community does not have tenure.

The Department of Land Affairs provides a similar settlement grant in land restitution claims, but these subsidies are not linked to geotechnical conditions. This settlement grant is meant to provide for both the purchase of the land, and for subsequent improvements – including services provision. The Cairn Test Case has demonstrated that the Community Trust Account, which is used as a vehicle for these funds, can be used to provide a basis for cost recovery and hence maintenance of the services.

KEY ISSUE

The Housing Subsidy is useful where new housing schemes are being developed, and particular services should be installed to ensure protection of the resource. (This could mean a request to install lower levels of services than originally planned). The Housing Subsidy can also be used in areas where people are taking ownership of existing houses without sanitation, and may wish to install basic sanitation systems.

6.3.3 Pollution levies and catchment levies

The National Water Act makes provision for the payment of pollution levies and catchment levies[6]. These are intended to promote the protection of the water resource and could be tapped to support interventions to limit pollution from settlements. These funds would be administered by the Catchment Management Agency, or DWAF where these agencies have not been established. Some Water Boards have funded service provision in their areas of jurisdiction, particularly where they perceive these services to improve the quality of the water they supply. These agencies could also be approached in this regard.

KEY ISSUE

Pollution levies or catchment levies will be useful in cases where settlement pollution has a significant downstream water quality impact, and where the Local Authority or service provider can not implement the interventions using their own sources. In these cases the economic benefits to improved downstream water quality should be significant. These funding sources may be particularly useful to address rural settlements.

[6] While the National Water Act makes provision for the collection of these levies, they have not yet been instituted by any Catchment Management Agency. DWAF is also still also formulating its water and pollution pricing policies.

6.3.4 Donor funds

Whilst donor funds are not the preferred source of funding, many donors would be willing to fund physical interventions that have been based on dialogue with the community, and where the social and institutional interventions are also in place to secure sustainability. In particular, donor funding intended for social upliftment and environmental protection could be leveraged once the causes of pollution have been identified.

KEY ISSUE

Donor funds are particularly useful to implement well-prepared projects that clearly address environmental and development issues, and where there is significant community participation. See Section 6.4.

6.3.5 Municipal Rates

Unfortunately, most of the pollution problem from settlements is associated with the poorest communities. Many of these do not pay municipal rates, or may not pay for the full operation and maintenance costs of their services. However, there are social obligations to use municipal rates from wealthier sectors to address the causes of pollution. This wider rates base should not only help maintain the services in poor areas, but could also be used to support physical interventions (i.e. services upgrades or repairs) in these areas. This is particularly important in the larger Metropolitan areas, where there is a larger rates base, and often a larger commercial and industrial basis for rates payment.

6.3.6 Equitable Share funds

National government has recognised that many Local Authorities, particularly those dominated by poor households, may be unable to raise sufficient taxes at a local level to provide even the most basic services. The Constitution therefore specifies that Local Authorities are entitled to a share in the revenue raised at a national level. This is known as the Equitable Share.

Equitable share funds are distributed from national government to local government based on their ability to raise revenue locally. As such, Local Authorities most in need of outside support will get a greater proportion of the Equitable Share fund. However, as a Constitutional grant, these funds are unconditional, and national government cannot dictate how these funds are used. Nevertheless Local Authorities not using these funds for providing basic services may face Constitutional challenges from consumers.

Equitable Share funds, therefore, provide a useful source of funds to ensure the ongoing maintenance of essential services (like waste management services). As such, where pollution problems stem primarily from a lack of funds to effectively maintain services, Local Authorities should be encouraged to use these funds to ensure a healthy environment. However, it must be recognised that there will be many demands on these funds, including the need to provide “free basic water”. In this respect, the Minister of Finance, in his 2001 Budget Speech, has specifically made provision for an increase in Equitable Share grant, from R 1 867 Million to R 2 618 Million in the 2001/2002-budget year, and to R 3 551 Million in the 2002/2003 year.

The Acornhoek Test Case provides an example of the use of the Equitable Share grant to provide for waste management services.

KEY ISSUE

The Equitable Share is the most important source of funds to help Local Authorities ensure the effective operation and maintenance of waste services. This will be particularly important for Local Authorities that have a high proportion of poor households on higher levels of services. Water quality management staff should actively encourage the use of these funds where there are significant health threats to the community.

6.3.7 Mayibuye funds

The purpose of this programme is to provide low-income households with land for residential and income generating purposes. This programme is funded by the Department of Land Affairs and is administered through the provincial Departments of Housing and Land Affairs. Mayibuye funds have been used to buy land for housing purposes, and their greatest value is to speed up greenfield schemes. The programme is limited to:-

- land acquisition
- pre-planning investigations
- town planning and preliminary engineering design
- site pegging and land survey
- township establishment
- conveyancing
- the settlement process.
- community liaison
- project management

These funds are, therefore, not directly available for the needs of this Strategy, but can be used within the planning process to ensure well-planned and laid out settlements in much the same way as the Housing Subsidy Scheme.

6.3.8 Private-Public partnerships

This is becoming an increasingly popular way of promoting service delivery. In these schemes private sector funding is used to fund the capital costs of service delivery, which will then be recovered by selling the services to the community, or to fund operation and maintenance costs. A number of these schemes have been initiated in South Africa over the last year. The success of these schemes still has to be demonstrated, but they nevertheless provide an opportunity to fund waste management services, and some of the Test Cases have developed simple waste management services on this basis. Funding for capital projects may also be used as collateral that can be used by the community to secure private sector loans, which can be paid off by the community leaving the capital sum untouched.

Various NGOs and quasi-government organisations have contributed to the funding of sanitation improvements e.g. Independent Development Trust Capital Subsidy Schemes, and the Community Infrastructure Programme. These, as well as local community efforts to improve their surroundings or services at their own cost could be promoted as a means of funding simple waste management services (see Cairn, Acornhoek Kliptown and Kaya Mandi). Similarly, subsidies (or part of the subsidy) could be used as surety at private banks instead of providing the loan directly to developers. Individuals could gain access to loan financing using this as surety without touching the original grant.

The Equitable Share grant has also been used to provide collateral for loans to initiate Private-Public-Partnerships.

KEY ISSUE

Private Public Partnerships are particularly useful where pollution results from a lack of waste management service, and where simple community based services can be installed. This is most often useful for simple community based solid waste collection systems.

6.3.9 Own funding

In many cases the community may be willing to fund interventions themselves. This can be particularly useful if the community owns the land, and in larger communities can represent a significant source of funds. This approach is however not appropriate for poorer communities.

6.4 Seed funding to identify the causes of pollution

The Test Cases have shown that nominal seed funding (up to R10 000 per case) has proved a very successful way of addressing the water quality effects of settlements. Seed funding can be used to run workshops to identify the causes of pollution. Once these are known, plans that address the physical as well as the underlying social and institutional causes of pollution can be drawn up. As these plans usually indicate more sustainable solutions to the problems, Local Authorities and other funding agencies are often more willing to provide financial support for the interventions. This seed funding has proven successful in the Bethulie and Acornhoek Test Cases.

More importantly, when seed funding is used to develop well-formulated projects, based on sound principles, it is usually easier to identify other sources of funding. Section 7.6 outlines a proposal to develop a “seed funding” facility specifically to address pollution in settlements using further support from the Danish government.

6.5 Funding operation and maintenance costs

The trite response to the Capacity gap problem is to ensure that new developments must always ensure that affordable levels of services are installed, and that where higher levels are installed, the community must pay for these services. However, higher levels of services have already been installed in many poor areas, and Figure 4.2, and Table 4.1 have indicated that many Local Authorities already have a high proportion of poor households on higher levels of services.

There are also significant pressures to install the highest level of services in new settlements. Many Local Authorities are therefore unlikely to be able to maintain their waste services without outside support. There are nevertheless sound arguments not to support operation and maintenance of services from outside the Local Authority as this may create a perverse incentive to local government to install unaffordable services. This would place exorbitant demands on national funds and is not viable.

However, Sections 6.3.5 and 6.3.6 have already made the argument that Municipal rates and/or the Equitable Share funds can be used to support operation and maintenance of services. But, these sources are unlikely to be sufficient in Local Authorities that have a high proportion of poor

households on High Levels of Services. In these areas, it will be important for poor households to at least contribute to their services.

Should sanitation and other waste services be free to the poor?

Government has committed itself to the provision free basic services to poor South Africans, and the Department of Water Affairs and Forestry has consequently initiated a strategy to provide for "free basic water" (i.e. some 6000L/m/household) to the poor. This means that the cost of providing this water to the poor is carried by the wealthier sectors in the Local Authority or by the Equitable Share. The "Free Basic Water" strategy also indicates that DWAF intends to investigate similar provisions for sanitation services.

However, similar provisions for basic sanitation are somewhat more complex. Poor households can voluntarily reduce water consumption to avoid incurring costs even if they are provided with in house connections, but poor households already provided with higher levels of sanitation and waste collection services have little option but to use these services. Higher levels of services must also be installed in the more densely populated areas to ensure adequate waste and sewage collection and disposal.

It is also unlikely that smaller Local Authorities could bear the *full* costs of higher levels of sanitation and waste collection services to all via cross subsidisation at a local level or from their Equitable Share. Nevertheless, the reduction of poverty will have the most profound impact on pollution from settlements. As such, there appear to be sound arguments to providing "subsidised" sanitation services to the poor i.e. the poor would have to contribute to the costs of maintaining higher levels of sanitation, where these have been installed.

Payment, even partial payment, for services also has the positive effect of creating a demand for well-maintained services, and also helps break the cycle of dependency which is critical to addressing poverty. In addition, the provision of "free" services could exacerbate the non-payment problem even among those households who could pay for services. (A number of Local Authorities have reported a decrease in payment rates since the announcement of free basic services.)

(see DWAF, 2001)

6.6 Conclusions

Experiences with the Test Cases have shown that interventions addressing the social and institutional causes of pollution are normally less expensive to implement. Institutional interventions can normally be funded out of the Local Authority's own budget, and in most cases these interventions fall directly within their existing mandate. In other cases these interventions simply require a change in the way in which services are supplied and maintained with little or no cost (in some cases even with cost savings!). However, in some cases service providers may have to extend waste management services and/or take on new staff. In these cases, these costs would have to be built into the Local Authority budget and may therefore require a few years to realise.

Similarly, interventions to address the social causes of pollution normally require awareness campaigns. These are often inexpensive, and the community members who were involved in the process of identifying the causes of pollution can do much of this work. More and more Local Authorities are also providing budgets for awareness campaigns, and in some cases national awareness campaigns can be used at little extra cost to the Local Authority. For example, awareness materials and plays on the use of the sewer system funded and produced by the Durban

Metro are available to other Local Authorities. (The Grahamstown Test Case has made use of this opportunity).

Conversely, the physical interventions are normally costly. These may include the repair of existing waste management services, or in some cases the extension of waste services or the provision of new services. It is in these cases that outside sources of funding are likely to be needed, and options to use some of the funding sources outlined above may be required. But in some cases it may be necessary to provide nominal seed funding, such that the requests for these funds can be motivated on a sound basis.

However, in the longer-term pollution from settlements can only be addressed by closing the capacity gap. This requires effective operation and maintenance of waste services, which in turn requires ongoing funding. In this respect, local government must be encouraged to use some of the equitable share grant on maintaining waste services, particularly as this may address some of the external costs associated with failing services (see Section 4). But it is also important that the communities at least contribute to the costs of maintaining higher levels of services.

SECTION SEVEN

THE NATIONAL STRATEGY

7.1 Introduction

This section of the report outlines how the Department of Water Affairs and Forestry will start addressing pollution from priority settlements. It describes the difference between proactive and reactive interventions, and how DWAF will help local government identify and address pollution from these settlements. This section also makes recommendations for how DWAF can contribute to addressing the Capacity Gap and non-payment problems in local government.

This section of the report also outlines how this Strategy will be integrated with water resources and settlement and services planning processes, and makes recommendations for how DWAF could support local government in addressing this problem. Lastly, this section of the report describes the roll out of the National Strategy in the Department's regional offices and CMAs in the medium to long term, but also the actions the Department will take in the short term to ensure the momentum of the Test Cases is not lost.

7.2 Reactive and proactive intervention

This project was originally intended to develop Strategies for DWAF – Water Quality Management or CMA staff to address the problem of pollution from densely populated, and often poorly serviced areas. This remains the primary focus of the project, and the project has developed and tested tools to identify and address the causes of pollution in settlements. However, the sustainability of the interventions developed in this process largely rests with addressing local government capacity problems. Local government or communities may also wish to implement the approaches developed irrespective of severe water quality threats. These interventions are unlikely to be successful unless local government capacity problems are addressed.

There is therefore a distinction between reactive (or rehabilitative) and proactive interventions to manage the water quality effects of settlements. *Reactive interventions* would be used where regional DWAF Water Quality offices, or Catchment Management Agencies want to address downstream water quality problems associated with pollution from settlements. In these cases DWAF or the CMA would initiate dialogue with the local authority and the affected community with the aim of identifying and addressing the root causes of pollution.

Proactive intervention is aimed at ensuring that the reactive interventions are sustainable, as well as ensuring the ongoing effective management of waste and sanitation services, even where the impacts on the water resource are less significant. Proactive intervention is therefore largely aimed at addressing the "Capacity Gap" on an ongoing basis. However, proactive intervention also requires planning of appropriate waste management services. This will primarily be given effect via the local government planning processes, i.e. the IDP and WSDP.

The following sections describe how both proactive and reactive interventions will be rolled out in South Africa.

7.3 How do you identify reactive interventions?

7.3.1 Background

Reactive interventions are aimed at addressing or rehabilitating existing sources of pollution. They would most often be used to address regional water quality problems resulting from settlements pollution, or where the Local Authority wants to address problems with their waste services. Communities may also initiate these interventions where they wish to improve living conditions and community health.

7.3.2 A Structured-Facilitated process

Each settlement is characterised by a unique set of problems, and interventions must be aimed at the settlement specific "root" causes of pollution in order for them to be successful. Previous attempts to manage pollution from densely populated settlements have not always been sustainable because they do not address all the underlying factors contributing to the problem, or have missed the root causes of the problem. The approach to identifying interventions must, therefore, focus on a settlement specific analysis of the causes of pollution. While the underlying causes of pollution identified in Section 3 provide some basis for this process, more detailed site-specific problems need to be identified in each case.

The Test Cases have used a "structured-facilitated" process to help identify the underlying causes of pollution. This process aims to identify the physical, social and institutional causes of pollution within the four waste streams (see Section 3.2). This process facilitates dialogue between DWAF, the community, the Local Authority (as the service provider) to jointly identify both the causes of pollution and the solutions to these problems. This is done by investigating the pollution problem in increasing depth until consensus and agreement can be reached on the root cause(s) of the problem. DWAF regional offices or the CMA would initiate this structured-facilitated process in priority polluting settlements on an ongoing basis. The integration of this prioritisation process and the water resources planning processes is discussed in the following section.

> DWAF regional staff have had training in the implementation of the Structured Facilitated process, and many have had on-site training in the Test Cases.
>
> The "How To" Guidelines provide details on the steps Water Quality Management staff, the Local Authority and Communities should take to implement this process. This section also provides guidelines on how to identify Stakeholders, run workshops and how to do a problem analysis.

7.3.3 Involvement by local government structures

Local government structures can help identify the causes and solutions to problems by providing technical expertise, but are important to ensure that the interventions are sustainable. In most cases local government will have to undertake the ongoing operation and maintenance of new services, or the ongoing implementation of new procedures identified by the process. Local government structures are also critical to ensure the financial and technical management of the interventions, for example to administer contracts and pay contractors, and collect services payments.

KEY ISSUE

While communities are often able to identify many of the causes of water quality problems without local government involvement, the Test Cases have shown that local government involvement is critical to identify appropriate solutions.

The Test Cases following have shown that the following local government departments must be involved in the process of identifying the causes and solutions to problems:-

- City Engineers Department – usually responsible for the sanitation and sewer systems.
- Health Department – usually responsible for clinics and health awareness, and solid waste collection.
- City Treasurers Department – to help identify payment problems.
- City Parks or Environmental Department – usually responsible for maintaining a clean environment.
- Councillors from the Environmental Portfolio Committee

7.3.4 Supporting local government to implement reactive measures

It is likely that, in many cases local government will need help to implement reactive measures. This will be particularly important in Local Authorities with limited capacity, or those that are in financial difficulties. In respect, support to local government for reactive interventions should follow the following steps.

1. DWAF (or CMA) - Water Quality Management staff identify settlements that are known to be causing significant downstream impacts.
2. DWAF (or the CMA) initiates dialogue with the community and Local Authority based on the approaches outlined in Section 7.3.2. (See also the "How To" guidelines)
3. The outcome of this process is a set of interventions and monitoring actions that address the root causes of pollution in settlements.
4. The Local Authority, Community and DWAF (or CMA) agree on an implementation program – this program is included in the Local Authority's Water Services Development Plan or directly into their Integrated Development Plan.
5. In cases where there are severe regional water quality problems as a result of settlement pollution, the set of interventions may be written up as a Directive under Section 19 or Section 20 of the National Water Act.
6. The Local Authority preferably implements this program using funding identified in the process, or in severe cases DWAF funds the interventions with the option of recovering costs under the Directive issued.
7. DWAF exercises the option to recover the costs based on the Local Authority's ability to cover these costs from their operating budget, and their implementation of effective cost recovery and good governance programs.

> The Department of Provincial and Local Government could consider similar support to Local Authorities that may want to initiate the structured dialogue process, but in cases where there is less of a threat to the water resource, and where community health issues are of greater concern.

This process of interaction is consistent with the Constitutional obligations for co-operative governance, but still makes provision for the "polluter pays" principle. However, the process also allows DWAF or the CMA to address priority settlements in Local Authorities that have little capacity – where payment is recovered after implementation under the Directive issued. It is, nevertheless, recognised that this approach will only work if regional offices have a budget to intervene in this way. This approach would also be further entrenched if it can be built into an "Agreed Procedure" under the Constitution.

KEY ISSUE

The Test Cases have shown that it is important to have a defined process and clear endpoint. But most importantly, it is necessary to indicate that the funding is available, and to have transparent accounting procedures for these funds. (i.e. the communities must know how much is available, and how it is being spent)

7.4 Planning reactive interventions in priority settlements

In the short-term, priority settlements will be identified and addressed by DWAF regional water quality staff. To support this process, the National Strategy and the Options for Post Project Funding (See Section 7.6) will be widely advertised to create an initial demand from local government and communities to have their problems addressed. This will allow a smooth transition from the current experiences in the Test Cases to the more widespread roll out of the National Strategy.

In this respect, the roll out of the National Strategy will done as follows:-

- DWAF regional offices will identify priority settlements based on their local knowledge of water quality problems. Each office will include plans to address these settlements into their Business Plans. The number prioritised will vary between the regions according to the resources they have to available, and the importance of settlement pollution in their areas.
- Local Authorities will be encouraged to implement reactive interventions in settlements they feel are polluting the environment, or in settlements where they wish to improve service delivery. Local Authorities may also initiate reactive interventions as part of implementation of their WSDP. Local Authorities have therefore been targeted to build their awareness of the approaches proposed in the previous section, and to disseminate the project materials.
- Communities or NGOs may also wish to initiate reactive interventions where they are concerned about community health. The "Dense Settlements" strategy will therefore also be advertised in magazines and newspapers that target communities and NGO groups.

In the medium to long term, the National Water Resources Strategy will be used to identify those Water Management Areas where pollution from settlements creates significant water quality problems. Catchment Management Strategies (CMS) would in turn be used to identify specific settlements or sub-catchments where attention should be given to pollution from settlements. The CMS would also identify those areas where settlement development holds particular risks for the water resource (i.e. areas on steep slopes, near sensitive water resources, where the groundwater table is close to the surface or areas on sandy soils – See the report on Planning to Avoid Pollution from Settlements). The CMS should therefore provide input to the Land Development Objectives (LDO) in these areas, and should also draw on the LDO to be able focus on areas where development is planned (Figure 7.1).

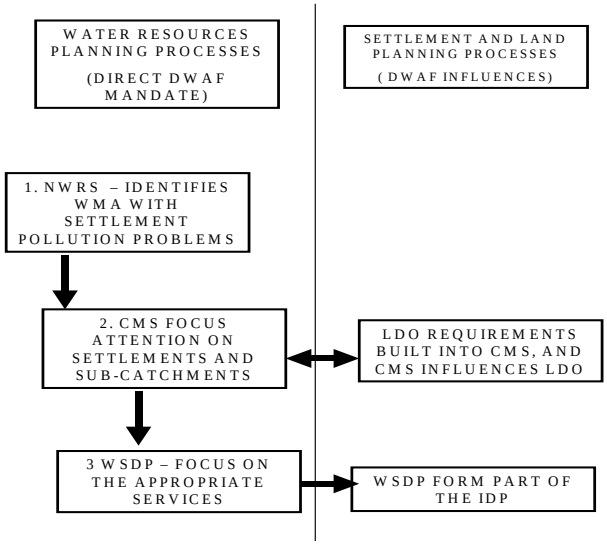


Figure 7.1 The process of identifying priority settlements for roll out of the National Strategy via water resources and settlement planning processes.

7.5 Promoting Proactive Interventions

7.5.1 Introduction

Proactive interventions are aimed at ensuring that the reactive interventions are sustainable, as well as ensuring the ongoing effective management of waste and sanitation services. Proactive intervention is therefore largely aimed at ensuring local government has the capacity to operate and maintain their waste management services on an ongoing basis, but also to promote appropriate planning of waste management services. These issues fall outside of the water quality management mandate, and also fall therefore outside of this National Strategy. There are, nevertheless, a number of actions that can be taken as part of the roll out of this National Strategy that will help promote proactive interventions. These are discussed below.

7.5.2 Support to capacity building in local government

Government has recognised that the key to securing a better life for all South Africans lies in ensuring better governance at a local level. Most national government agencies therefore have local government capacity building programs, and there have been significant increases in financial support to local government (See Section 6.5). The local government demarcation process also increased local government capacity by reducing costs, increasing the local tax base and increasing access to technical support.

Donor agencies have also recognised the importance of ensuring good governance at a local level, and donor support to local government capacity building was in excess of U$ 200 Million over the last year. Over and above this, the Department of Provincial and Local Government, as well as the Water Services Chief Directorate of DWAF are investing considerable resources in building capacity within local government – mostly aimed at ensuring financially sustainable service delivery. In this respect, the Water Services Development Planning capacity building programmes now include components of this National Strategy, and regional Water Quality Management staff have contributed to the WSDP roadshows in each province.

In addition to this, this National Strategy, together with all the supporting guidelines and technical reports will be disseminated to all Local Authorities in the country, and simple one-day training sessions in the use of the strategy will be given at venues throughout the country.

7.5.3 Contributions to addressing the non-payment issues

The non-payment problem is likely to remain one of the most important contributors to the lack of local government capacity. Non-payment, for a variety of reasons remains widespread throughout South Africa, in spite of the efforts of the Masekhane campaign. There have nevertheless been a number of successful non-payment campaigns. An analysis of these has highlighted 5 common factors of successful campaigns;

1) Education and awareness building, - communities must know why it is important to pay.
2) Participation and Representation, - communities must participate in, and be represented as part of the non-payment campaign.
3) Incentives, - there should be more direct benefits to payment i.e. improved services.
4) Enforcement, - ongoing defaulters must have some services cut off, and
5) Management – the Local Authority must effectively meter and bill services.

(see the report on the Non-payment problem.)

All five of these issues should be addressed in any payment campaign. However, there is unlikely to be widespread successful payment campaigns without a national approach to the problem, which provides clear incentives for local government to implement non-payment programmes based on these 5 principles. This National Strategy therefore not only advocates such a national campaign,

but also that affordable levels of services should be installed where-ever possible, and where higher levels of services have been installed, that all users should at least contribute to the costs of these services.

7.5.4 Planning appropriate levels of waste management services

Appropriate waste services planning is perhaps the most effective way of ensuring pollution problems are minimised. This primarily lies within the ambit of Water Services Development Planning process, and it is not necessary to provide for a separate process for this project. As such this project has contributed to Water Services Development Planning toolbox, and regional Water Quality Management Staff have received some training in this regard. The report on Planning to Avoid Pollution provides additional details and ongoing training materials in this regard.

However, it is still important Local Authorities receive further some guidance on the links between appropriate levels of services, environmental characteristics (see Section 3.9) and pollution. In this respect the capacity building programmes referred to in Section 7.5.2 will also be used to help Local Authorities find the right balance between the levels of services, the settlement density, environmental and socio-economic factors – but most importantly to ensure financially sustainable services. Table 4.1 in the Planning Report makes some recommendations in this regard.

7.6 Opportunities for post project support

The Test Cases have show that seed funding, when used to identify the causes of pollution has provided the impetus to identify other local sources of funding to implement the interventions (see the Bethulie and Acornhoek Test Cases. This project has therefore recommended that Danced develops a "Dense Settlements Project Initiation Facility", within the Development Bank of Southern Africa. Danced is currently evaluating this proposal.

Should this Facility be established, Local Authorities or NGOs would apply to the Facility for seed funding to initiate the structured-facilitated process outlined in Section 7.3.2, but at this same time the Facility will establish the links to other sources of funding, and would provide the project materials to the applicant.

This Facility should address the following issues:-

- How will the process of requesting support be initiated?
- How much money is required to seed each case?
- How would links to existing funds be established?
- How would links to people who have been involved in the Test Cases, and who could provide support to the implementation process, be established?
- How would the process be monitored?
- How many settlements could be addressed?

7.7 Roll out of the National Strategy

As outlined above, the roll out of the National Strategy will take place through two mechanisms; firstly by reactive interventions in priority settlements, and secondly by promoting proactive interventions by helping to build capacity within local government.

Ongoing reactive interventions will be secured firstly, by encouraging DWAF regional offices to immediately start addressing the worst settlements using the post project support, and secondly by integrating the Strategy with water resources planning processes (i.e. the NWRS and the CMS). DWAF regional offices will identify and address 1-3 settlements per year in each province. The prioritisation of these settlements will be based on their local knowledge of water quality problems.

Local Authorities or NGOs may also initiate reactive interventions. The Project Initiation Facility may support these reactive interventions with initial seed funding.

Ongoing proactive implementation of the National Strategy will occur primarily through the using the WSDP to ensure that the levels of services are environmentally and financially sustainable. In this regard, the WSDP toolbox and the associated capacity building programmes already include components of the National Strategy, and regional DWAF staff have received appropriate training. However, this project will also be building awareness within local government, specifically aimed at addressing pollution from settlements on an ongoing basis. Lastly proactive interventions will be promoted by supporting payment campaigns, such that local government has greater financial capacity to address pollution on an ongoing basis.

REFERENCES

Bruwer CA (1979) The economic impacts of eutrophication. Department of Water Affairs and Forestry, Technical Report, Department of Water Affairs and Forestry, Pretoria, South Africa.

DWAF (1991) Water Quality Management Policies and Strategies in the RSA, Department of Water Affairs and Forestry, Pretoria, South Africa.

DWAF (1995) Procedures to Assess Effluent Discharge Impacts – South African Water Quality Management Series. Department of Water Affairs and Forestry, Pretoria, South Africa

DWAF (1997a) A protocol to manage the potential of groundwater contamination from on site sanitation, Department of Water Affairs and Forestry, Pretoria, South Africa

DWAF (1997b) White paper on a National Water Policy for South Africa, Department of Water Affairs and Forestry, Pretoria, South Africa

DWAF (2000) Policy and Strategy for Groundwater Quality Management in South Africa (1st ed), Water Quality Management Series, Department of Water Affairs and Forestry, Pretoria, South Africa

DWAF (2001) Free Basic Water Provision, Key issues for Local Authorities (Version 1), Department of Water Affairs and Forestry, Pretoria, South Africa

Howard JR, Olën B, Eales K, Douglas S, Quinn N and Voller R (2000) The Development of an on-site sanitation planning and reporting aid (SSPRA) for the selection of appropriate sanitation technologies for developing communities. Water Research Commission Report 586/2/00, Pretoria, South Africa

Pegram GC, Quibell G and Görgens AHM (1997) Non-point sources in South Africa: A Situation Assessment. Water Research Commission Report, 696/1/97, Pretoria, South Africa

Pegram GC, Rollins N and Espey Q (1998) Estimating the costs of diarrhoea and epidemic dysentery in KwaZulu-Natal and South Africa, *Water* SA 24 (No.1), pp11-20.

Serageldin I (1994) Water Supply, Sanitation and Environmental Sustianability – The Financing Challenge. The World Bank, Washington USA.