

REPUBLIC OF SOUTH AFRICA

**Water Quality Management  
Series**

**Operational Guideline  
U 1.7**

**Managing the Water Quality  
Effects of Settlements: -**

**GUIDELINES  
FOR  
COMMUNITY MEMBERS**



Department of Water Affairs and Forestry

**SEPTEMBER 2001**

**Water Quality  
Management Series**

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**MANAGING THE WATER QUALITY EFFECTS OF SETTLEMENTS:-**

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FOR  
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**Department of Water Affairs and Forestry**

**SEPTEMBER 2001**

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## 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

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## ACKNOWLEDGEMENTS

This series of reports is the result of a collaborative effort from a great many people. The inputs of 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.
- 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.

Special mention must also be made of the members of the 9 Test Case Steering Committees, and of the 9 Regional Deputy Directors: Water Quality within the Department of Water Affairs and Forestry. These people are listed on the following two pages.

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.

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- John Charlton: Carl Bro
- Christian Sørensen: Carl Bro
- Charlotte Mathiassen: Carl Bro
- Gitte Jakobson: Carl Bro

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- Hubert Thompson: Thompson and Thompson
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The CD for the project was developed by ISIFUNDI IT Consultants.

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

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## 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.

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## ROADMAP TO THE STEPS IN THE PROBLEM ANALYSIS

### STEP 1

DO A PRELIMINARY PROBLEM ANALYSIS AND LIST ALL POLLUTION PROBLEMS AND

### STEP 2

MEET WITH YOUR LOCAL AUTHORITY (SERVICE PROVIDER) TO REACH CONSENSUS  
ABOUT THE FACT THAT THERE IS A PROBLEM AND TO DO A STAKEHOLDER  
IDENTIFICATION PROCESS

### STEP 3

JOINTLY DETERMINE THE ROOT CAUSES OF POLLUTION BY ASKING THE QUESTION  
“WHY”

### STEP 4

PREPARE A PROBLEM TREE BASED ON THE OUTCOME OF THE PROBLEM ANALYSIS  
WORKSHOP IN STEP 3

### STEP 5

IDENTIFY POSSIBLE SOLUTIONS TO THE ROOT CAUSES OF POLLUTION AND DEVELOP  
AN INTERVENTION PLAN – ASK THE LOCAL AUTHORITY TO IDENTIFY FUNDING TO  
IMPLEMENT THE PLAN

# 1 INTRODUCTION

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## 1.1 BACKGROUND

The Department of Water Affairs and Forestry (DWAF) have an obligation to protect the quality of all water resources in South Africa. One of the most important impacts on the quality of water is pollution from densely populated and poorly serviced areas. However, managing the water quality impacts of these areas means that the wide ranges of social, political, institutional and economic conditions that affect pollution from the settlement have to be recognised. DWAF consequently developed the National Strategy to Manage the Water Quality Effects of Settlements that helps communities and Service Providers (usually the Local Authority) address their problems.

The aims of this National Strategy are to:

1. Outline DWAF's policy for managing pollution from densely populated areas, and
2. Describe a process of trying to identify the actual causes of pollution in such settlements

This entails trying to obtain and maintain a balance between the following elements:

- ☒ The sensitivity of the receiving water resources.
- ☒ The amount of waste produced in terms of the size and density of a settlement.
- ☒ The level and operation of services in a settlement.
- ☒ Financial sustainability.

However, the National Strategy is not aimed at getting higher levels of services for these areas, but rather at ensuring that those services that are supplied are used and looked after properly. As such, it usually aims at addressing the pollution problems with existing services, but in some cases where there are no services – the Strategy will help get the right services in place.

The National Strategy is implemented at local level using a structured-facilitated way of characterising the causes of pollution in a settlement (doing a problem analysis). The structured-facilitated process provides a step-wise process to rapidly identify all the factors that contribute to a settlement's pollution problems. The reader must be familiar with the [National Strategy document](#) before undertaking these steps.

## 1.2 WHO SHOULD READ THIS GUIDE?

Regional Department of Water Affairs and Forestry officials, a Local Authority (LA), or interest groups within a community can use the structured-facilitated process to help find and address pollution problems. But, this guide is intended for local communities or NGOs active in the community. Additional guides to doing a problem analysis have been developed for these other users.

## 1.3 WHY SHOULD YOU ADDRESS POLLUTION IN YOUR SETTLEMENT?

Pollution problems such as litter in the streets or broken drains pollute the water in your settlement. Polluted water can lead to serious illness, such as diarrhoea, cholera and skin and eye diseases, especially among children and the elderly. It can also poison vegetables and livestock. Polluted water in your settlement can even effect the health of people and the environment in other settlements that are down stream from you. Similarly, people from your settlement can be effected by the pollution problems of other settlements.

This guide will help you find and solve the root causes of pollution problems in your settlement. You can also see how other communities have addressed their problems by looking at the [Test Cases](#) presentations

## 1.4 PURPOSE OF THIS GUIDE

The purpose of this guide is to assist local communities to identify the root causes of pollution in the settlement, especially the causes that the community themselves are responsible for, and to identify the solutions to these causes. However, local communities cannot solve their problems by themselves, are not alone in solving their pollution problems. So the guide will also show how you can work together with your service providers to address the pollution problem. (A service provider is someone who provides and looks after the services to collect waste in the settlement, or who provides the sanitation (toilet) services.)

**Remember**, According to the Constitution of South Africa, the Local Authorities must provide for basic services. But the community must take the responsibility for helping to control pollution by looking after these services.

## 1.5 SUPPORTING DOCUMENTATION

This Guide is not intended to be a detailed description of how to implement the structured-facilitated approach, but is simply intended to outline the steps a community or NGO should take when addressing pollution from settlements. The Guide is therefore supported by more detailed "How To" Guidelines. These include

 How to implement the National Strategy.

[Intervention Options. Operational Guideline U 1.2](#)

(This document presents alternative options for addressing pollution problems)

 [A Guide to Problem Analysis](#)

(This document provides a detailed guide on how to identify and solve the underlying causes of pollution in settlements. It also describes how to develop monitoring programmes to assess the efficacy of interventions.)

 [A Guide to Stakeholder Identification](#)

(This document provides a detailed guide on how to select stakeholders.)

 [Working Towards a Clean and Healthy Community](#)

(This is an information booklet available in English, isiZulu, seSotho and Afrikaans, which helps stakeholders participate in a meaningful way.)

 [A Guide to holding workshops](#)

(This document is meant to help those who have not been extensively involved in arranging and/or facilitating workshops related to the structured-facilitated approach, and workshops to find the causes of pollution)

## 2 PLANNED INTERVENTIONS

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### 2.1 WHAT ARE PLANNED INTERVENTIONS?

The National Strategy recommends that communities and Local Authorities should start identifying and addressing their own problems, even if the Department of Water Affairs and Forestry has not started work in your settlement. This is called the pro-active management of pollution problems, and it will take place by carefully planned interventions. Planned interventions are deliberately planned according to the steps outlined below. These steps will lead to the development of an Intervention Plan, which will serve as an agreement between the community and the Local Authority to address the problems. But it is important that this plan links in with local government planning approaches as well as the plans of other levels of government, such as:

- ?? Local and Provincial Integrated Development Plans.
- ?? Local Authority Land Development Objectives.
- ?? Local Authority Storm Water Master Plans.
- ?? Local Authority Water Services Development Plans.
- ?? Provincial Environment Departments' General Waste Management Plans.
- ?? Catchment Management Strategies.
- ?? Other planning initiatives.

You should ask your Local Authority about these other activities before starting the steps outlined below, so that you can make sure that you link in with these.

You may also be able to access a "Funding Facility" to help you go through the process outlined in this report. This Facility will provide nominal funding to help you run the workshops, and or to appoint consultants to help you do this. This funding could also be used to print additional copies of some of the training materials provided on the CD.

However, this funding facility will also provide the links to other sources of funding that could be used to implement some of the interventions you decide on. You should ask your Local Authority or regional DWAF office to help you access these funds.

## 2.2 WHAT STEPS SHOULD YOU TAKE?

### Assumption

It is assumed that the community have recognised that there are pollution and health problems in their settlement and are prepared to help address these.

#### 2.2.1 Step 1: Organise a meeting among yourselves to do a preliminary problem analysis

##### *What should you do?*

The members of your community or NGOs that are operational in the settlement should organise a meeting among residents to discuss the pollution problems in your settlement. You should try to understand what might be causing the pollution problems in your settlement. This is called a preliminary problem analysis and some advice on how to do this is provided in the [Guide to Problem Analysis](#). The result of this meeting should be list of what the pollution problems are, and what you think may be causing them.

This will help you with the next step, where you can demonstrate to the Local Authority that you have thought about the causes of pollution in the settlement, and that you recognise that that both the community and Local Authority are involved in causing this problem.

##### **How do you do a preliminary problem analysis?**

You do not need to do a thorough problem identification and analysis at this point. A preliminary problem analysis merely assists you to get a sense of what may be causing the pollution problems in your area.

A preliminary problem analysis can be done as follows:

- ?? Look at your settlement to try to understand what the problems are and where they are coming from. You should also identify where the major problems are occurring.
- ?? Consult with your neighbors to gather more information.
- ?? Move around in the settlement to identify indicators of pollution and to unpack the causes of pollution.

You should use [Table 1: Research Tools for Evaluating Indicators](#) in the Guide to Problem Analysis to help you.

##### *What additional tools would help you?*

[Section 3 – The Causes of Pollution from Settlements](#) in the National Strategy document can offer guidance in understanding the causes of pollution.

The community booklets: [Working towards a clean and healthy community](#) in the local languages will also help you understand the causes of the problem in more detail.

## 2.2.2 Step 2: Meet with your LA to reach consensus about the fact that there is a problem and to identify stakeholders who should be involved

### *What should you do?*

The Local Authority (as the service provider) must be involved in helping you address the pollution problems. But it is important that the community demonstrates a real desire to address the problems, and that they recognize that they are at least partially responsible for the problems. You should therefore approach the Local Authority with the preliminary problem analysis done in the previous step, and you should ask them to help you take the process forward. You should approach your local councilor or the Engineering Department or the Health Department to help you.

In addition, the structured-facilitated approach will only work if all the relevant stakeholders are present. It is therefore important that you identify the right stakeholders together with the Local Authority. You should therefore meet with Local Authority staff from the Health, and/or Engineering Departments. You should also try to get the Environmental Portfolio Councilors and your local councilor to attend.

This meeting should involve the following:

- ?? Explain that as the residents of the settlement, you have identified certain pollution problems and you are meeting with them to solve it with their help.
- ?? Explain what you have preliminarily identified as the causes of pollution (result of your preliminary problem analysis in Step 1.)
- ?? You should identify stakeholder together with the Local Authority.
- ?? You should then set a date for a follow up workshop to go into the problem in more detail.
- ?? The training material on the National Strategy: [Working towards a clean and healthy community](#) (in the local language) must be distributed among the community. This will help you with the next step.

#### **How do you do Stakeholder Identification?**

- ?? List all possible stakeholders connected or influenced by the pollution in and from the settlement. Stakeholders within the community can include, for example, youth and women's groups.
- ?? Stakeholders from the Local Authority should include environmental portfolio councilors, local councilors and staff from the health, city engineers and treasury departments.
- ?? Stakeholders from other organisations, such as the Department of Water Affairs and Forestry - Regional Water Quality Management or the Catchment Management Agency officials should also be identified
- ?? Categorise the stakeholders in terms of affected, involved or interested.
- ?? Explore the characteristics of the group, such as the status and structure of the group.
- ?? Identify the interests, motives and attitudes of each stakeholder group.
- ?? Illustrate relationships between interested, affected and involved parties.
- ?? Evaluate the potential of each group, for example what can they contribute or withhold.
- ?? Evaluate the implications for project planning if the group were left out.
- ?? Evaluate your information and choose stakeholders for the process.

(See the Guide to Stakeholder Identification)

### *What additional tools would help you?*

The Guide to Stakeholder Identification should help you here refer to the [Introduction](#) and [Section 2: How do you include stakeholders in your process?](#) For background on the importance of community participation and further guidance.

### 2.2.3 Step 3: Determine the root causes of pollution

#### *What should you do?*

A problem analysis is done to identify, select and implement interventions that address the root causes of pollution problems. The problem analysis has to be done in a facilitated workshop with all identified stakeholders using the structured-facilitated process. Working committees or interviews and questionnaires can also be used to facilitate stakeholder participation. The [Guide to Problem Analysis](#) must be used to help you do this.

In this workshop, all stakeholders should be given opportunity to speak freely about the causes of pollution and all comments should be recorded. The result of the workshop should be a list of all identified causes of pollution in the settlement obtained by asking the question “why” in relation to specific pollution problems. You should make sure that stakeholders have identified social, institutional and physical problems in each waste stream.

#### **How do you determine the root causes of pollution?**

- ?? The problems identified during your preliminary problem analysis will now need to be fleshed out in a lot more detail. All stakeholders need to jointly identify and prioritise the main problems that are associated with each of the waste streams (sewage, sullage, stormwater and solid waste) so that all stakeholders are clear on what the effects of pollution problems in the settlement are.
- ?? Determine the root causes of pollution problems. You do this by repeatedly asking *Why did this happen?* In order to understand the chain of events that result in the specific symptom being observed. Eventually you will arrive at the root causes of the problem. You now need to determine whether the causes are physical, institutional or social because this will help you to identify the best possible solution to the identified problem.
- ?? Verify the symptoms and causes. The causes of pollution problems that were identified during stakeholder consultation need to be verified with factual evidence obtained through site visits, sampling and surveying. This will support the perceptions of the stakeholders and provide scientific back-up data to support the need for interventions.

#### *What additional tools would help you?*

Use the [Guide to holding workshops](#) to help you with organizing and running the workshop. You should familiarise yourself with – [Section 3. The Causes of Pollution from Settlements](#), in the National Strategy before holding the workshop. The [Guide to Problem Analysis](#) will also help you focus on the right problems.

## 2.2.4 Step 4: Prepare a problem tree

### *What should you do?*

Problem trees provide a visual breakdown of problems into their symptoms and causes. Problem trees are very effective in creating awareness among stakeholders about the problem, how they and others contribute to it and how it effects their lives. This helps to create support for the interventions to solve the problems.

Problem trees are never “right” or “wrong”, as long as they address a water quality issue, and good problem trees simply allow stakeholders to have a common, well-informed understanding of the pollution problems in the settlement and how they are connected. You should prepare the problem tree based on the outcome of the problem analysis workshop described in Step 3. Problem trees should be prepared for each waste stream.

You should also present the completed problem trees to the stakeholders during a workshop, to get their feedback on the cause and effect links. All the stakeholders should cooperate to add to and improve the problem trees until consensus is reached about what the problem trees portray.

### **How do you develop a problem tree?**

- ?? Identify all the pollution problems in the four waste streams. Use the information you have gathered from the workshop (in Step 3) to develop a problem tree.
- ?? Select one problem at a time for the analysis. This is not necessarily the main or most important problem. Rather this provides a starting point for building the tree. Write this statement on a different colour card.
- ?? Go through the cards that were compiled during Step 3 to establish the causes and effects of this particular problem. If necessary get additional information on the problem as soon as possible to complete the problem tree accurately.
- ?? Arrange the index cards on a convenient surface into cause and effect relationships around the focal problem.
- ?? As you do this, test the logical flow of the arrangement by doing the following:
  - ✉ Add cards if needed to complete the cause and effect logic. That is, if there is a gap in the logic you will need to explore what is causing the problem, or what the effects are.
  - ✉ Remove cards that are repetitive.
  - ✉ Rewrite cards to be more specific and accurate. Be sure the statements are meaningful.
- ?? Review the problem tree with all relevant stakeholders to ensure that they agree that the cause-effect relationships are valid.

### ***What additional tools would help you?***

The [problem tree](#) section of the Guide to Problem Analysis must be used to help you with this step.

## 2.2.5 Step 5: Identify possible solutions and develop an Intervention Plan

### *What should you do?*

You should facilitate a workshop with stakeholders to identify appropriate solutions to the root causes of pollution. The result of this workshop should be the development of an Intervention Plan that all stakeholders agree to.

Interventions are a range of actions that will address (solve) the root physical, social and institutional causes of pollution as identified during the problem analysis and problem tree steps. These Interventions will be things that the Local Authority must do, as well as things the community must do. The Intervention Plan should provide a plan for the most effective, least costly way to address the social, physical and institutional root causes identified.

An Intervention Plan also includes how various options will be financed, who will do them, when will they be done, and how you will monitor that they have been effective. You will need to use this Intervention Plan to help secure funding to implement some of these interventions. You should also ask the Local Authority to include your Intervention Plan into the Water Services Development Plan, and/or into the Integrated Development Plan. This will help you secure the funds from your Local Authority budget to implement your interventions.

If you applied for funding from the Funding Facility, your Intervention Plan should be submitted to the Facility so that they can identify suitable sources of funds to help you with implementation.

### **How do you develop an Intervention Plan?**

- ?? Use the Problem tree as a basis to formulate actions that will solve the problems.
- ?? Prepare a plan that outlines the interventions required.
- ?? Use the [Options for Interventions Guide](#) for identifying and developing an appropriate list of interventions.
- ?? Specify expected outcomes of each intervention.
- ?? Develop implementation schedules, specific deliverables and the costs attached thereto.
- ?? Use the deliverables as a basis to develop your first set of Key Performance Indicators.
- ?? You must include a Monitoring Plan. This will help to keep track of what was done, and whether this was effective.

### *What additional tools would help you?*

You should use the [Identifying Appropriate Interventions and Monitoring](#) section of the problem analysis guide and the [Options for Interventions](#) report to help you develop your Intervention Plan.

[Section 6 – Financing Interventions](#) of the National Strategy Document will also help you identify suitable sources of financing.