

## Water and mining

### A new guide from the WRC aims to provide support for implementation of cleaner production in the mining industry.

#### Introduction

The new Cleaner Production Guidance Document is the outcome of investigations carried out with a view to introducing cleaner production technologies to the South African mining sector. These investigations focused on the use of tools such as quick scan assessments, lifecycle assessments, and cleaner production forums to encourage and motivate the mining industry to implement cleaner production in order to reduce their environmental impact and increase profitability.

The investigations led to the preparation of a draft guidance document subsequently (in September 2007) presented at two workshops in to obtain input from industry, government and other stakeholders. Over 100 participants from 22 mining-associated organisations attended these workshops. Input from the workshop as well as other feedback obtained from relevant sources was recorded and suggestions incorporated into the final Guidance Document.

As a concept, cleaner production is synonymous with best practice environmental management. It is a general term that describes an approach aimed at increasing resource efficiency and reducing the generation of pollution and waste at source, rather than dealing with the waste once it has been produced. Cleaner production is a broad term, encompassing what is sometimes also referred to as waste minimisation, pollution prevention, or eco-efficiency.

In essence, cleaner production is about:

- Preventing waste and pollution at source;
- Minimising the use of hazardous raw materials;
- Improving water and energy efficiency;
- Reducing risks to human health;
- Saving money;
- Improving efficient management practices; and
- Promoting sustainable development.

#### Purpose and scope of the Guidance Document

The aim of the Guidance Document is to assist the mining industry and its regulators in determining the benefits of implementing cleaner production and associated methodologies. Case studies and examples are incorporated to demonstrate how cleaner production has been implemented successfully in mining companies, both locally and internationally.

Checklists are made available to guide the user through each stage of the cleaner production process. Inclusion of a brief review of relevant legislation and official government documents serves to promote better understanding of policies, laws and guidelines that govern and enable cleaner production approaches. Finally, comprehensive lists of recommended reading material and useful web addresses are provided.

The Guidance Document focuses on the main minerals being mined in South Africa, namely coal, gold and platinum, but the methodology described is applicable to all minerals and mines.

#### Beneficiaries

The Guidance Document is aimed primarily at those working in and with the mining industry, with a secondary focus on those government departments regulating the mines. The document will assist mining companies in implementing a cleaner production programme while, at the same time, providing regulators with suggestions on how to promote and encourage the process.

It will also assist companies and regulators in identifying where they stand with respect to best practice, where opportunities exist for implementing cleaner production options, and where cleaner production technologies are

already in place. Consultants to the industry will also benefit from the Guidance Document as it will provide necessary background information to the sector and suitable cleaner production opportunities.

## Guidance Document structure

The Guidance Document is divided into six Chapters and seven Appendices as shown below:

- **Chapter 1** introduces the South African mining industry in South Africa and provides with an overview of the associated environmental impacts.
- **Chapter 2** reviews relevant legislation, the focus being on promoting (a) closer acquaintance with laws and regulations that promote cleaner production, (b) better understanding of how cleaner production could assist mining companies in complying with legislative requirements, and (c) use of the Department of Water Affairs' series of best practice guidelines that have cleaner production relevance.
- **Chapter 3** provides an introduction to the cleaner production concept, its benefits, the methodology of implementing a cleaner production programme, and how to identify and overcome barriers.
- **Chapter 4** presents an introduction to some cleaner production tools, including monitoring and targeting, life cycle assessment, cleaner production forums and awareness-raising.
- **Chapter 5** provides general guidance on the incorporation of cleaner production into existing environmental activities within the mining industry, with an emphasis on environmental management systems and international best practice.
- **Chapter 6** aims to provide regulators with guidance on how to identify cleaner production practices being implemented and to promote further cleaner production practices.
- **Appendices 1 to 7** contain numerous checklists and worksheets designed to provide step-by-step guidance in working through each stage of implementing a cleaner production programme. Checklists are aimed at each role-player in the mining industry and also to reveal cleaner production opportunities. Guidance is provided with regard to cleaner production reporting formats. Lastly, relevant information in the form of literature references, recommended reading material, sources of further information and a list of useful contacts, is provided.

Case studies are included throughout the Guidance Document to illustrate the steps to implementing cleaner production and reaping the related benefits.

## Recommendations for effective use of the Guidance Document

This Guidance Document is intended to assist mining companies, mining-sector regulators and consultants in implementing a programme of cleaner production, identifying cleaner production opportunities, sustaining such a programme through promotion and awareness-raising.

In order to achieve this, the following steps should be followed:

- Understand the main *mining processes* in South Africa and the associated *environmental and health impacts*;
- Ensure a good understanding of the *concept of cleaner production*;
- Become familiar with the *legal and policy framework* relevant to the implementation of cleaner production in the mining sector;
- Become familiar with the *main steps* involved in implementing a structured cleaner production programme within an organisation;
- As a mining company, make use of the *checklists/worksheets* to enable implementation of each stage of a cleaner production programme;
- As a regulator, use checklists/worksheets to identify where opportunities for cleaner production exist or have been exploited;
- Make use of the *tools of cleaner production* such as monitoring and targeting, identifying the true cost of waste generated and life cycle thinking;
- Identify the possible *barriers* to implementing cleaner production and ways in which these can be overcome;
- Understand how cleaner production can be *incorporated* into existing environmental management programmes;
- Investigate the possibility of joining or creating a *cleaner production forum* to allow for the exchange of information and advice on cleaner production activities;
- Identify suitable cleaner production practices for various mining operations based on best practice by making use of the *checklists* provided;
- Be aware of the importance of *raising awareness* at all levels of staff in cleaner production practices;
- As a mining company, regulator or consultant, *understand own role* in implementing and promoting cleaner production; and
- Make use of the extensive list of *references*, internet resources and case studies available.

### Further reading:

To obtain the report, *Cleaner Production: A Guidance Document for the Mining Industry in South Africa (Report No: TT 485/11)* or the related document, *The Introduction of Cleaner Production Technologies in the South African Mining Industry (Report No: 1553/1/11)* contact Publications at Tel: (012) 330-0340; Fax: (012) 331-2565; E-mail: [orders@wrc.org.za](mailto:orders@wrc.org.za); or Visit: [www.wrc.org.za](http://www.wrc.org.za)