1. IMPORTANCE OF MINING

South Africa is endowed with vast mineral resources which has made possible the growth of the mining industry which is still, to some extent, the foundation of the country’s economy.

The mining industry in the RSA, forms an essential component, especially with regard to the stimulation and stabilization of the economy and is therefore also an important factor in the reconstruction thereof. It is a statutory right of the holders of mineral rights to utilize or to allow such rights to be utilized in terms of the mineral legislation of the RSA. This principle applies to the State as well as the individual or private concern and is vested in the free market principle on which the economy of the RSA is based. It is, therefore, one of the primary functions of the Department to propagate the mineral potential of the RSA. This is in the national interest and to encourage the utilization of mineral rights.
Mining requires vast capital expenditure and the Department is obligated to constantly guard against the deterrent of intending investors in the mining industry by especially impractical statutory encumbrance which could injure the national, economic, and socio-economic structure.

2. HISTORY OF ENVIRONMENTAL MANAGEMENT IN SOUTH AFRICAN MINES

Mining commenced before the start of the century in our country - more than 100 years ago.

Mining towns were established in the vicinity of the mines. Surface disturbance was of little significance as wide open areas existed.

Mines, however, attracted through the years more and more people and associated industries and open areas shrank progressively until we are now virtually living on the doorstep of many mines in the metropolitan areas.

Prior to the 70's very little legislation existed to enforce effective environmental management and even though relevant legislation was increasingly promulgated since then, it was difficult to enforce. In scrutinising the Mines and Works Act of the Union (Act No 12 of 1911) and Mines and Works Act of the Republic (Act 27 of 1956), safety was of paramount importance.
Under the repealed Mining Rights Act, 1967 (Act 20 of 1967), and the Precious Stones Act, 1964 (Act 73 of 1964), the State retained the right to grant permission to prospect for or to mine precious metals and precious stones respectively. This meant that any intending prospector or miner first had to obtain the right to prospect or mine from the State, even if he owned the mineral. Consequently the State knew of every such prospector or miner involved with precious metals or stones. Conversely, the owner of the right to a base mineral or a person with his permission could prospect and mine without any official authorization. The only way that the State would become aware of such operations was if the prospector or miner complied with the provisions of Mines and Works Regulation 2.1 which required him to notify the then Inspector of Mines of his operations. This was most unsatisfactory because many a small operator slipped through unnoticed, leaving behind unsightly, unwanted landmarks.

Then in 1980 regulations were promulgated to control the rehabilitation of land disturbed by opencast mines. That improved the situation somewhat but was still totally unsatisfactory, mainly because of the inadequate penalties, a fine of R300, which was no deterrent to any would-be culprit.


The Minerals Act has been built on three main pillars:

(i) **optimal exploration, processing and utilisation of minerals**;

(ii) **safety and health of workers in and at mines**; and

(iii) **the rehabilitation of the surface of land during and after prospecting and mining operations**.

3.1 **Rehabilitation: One of the Main Objectives of the Act**

Rehabilitation is *one of the main objectives of the Act*. It requires circumspection, planning and tact from the Regional Director when an application for a prospecting permit or mining authorization is considered, whereas mostly there are several parties with alternative interests either in the land which is the subject of the application, or adjacent areas.
Although it is a complex task, the Department is not indifferent to the violation, scarring or defacement of the environment by surface disturbances and has in fact for years endeavoured to minimize the impact on the environment by mining activities. Environmental management must be integrated with the normal mining operation and make a positive contribution towards optimal utilisation.

4 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMP) AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT (EMPR)

EMP and EMPR - What is the difference?

**EMP:** The EMP describes how the identified impacts of the mines activities will be managed and forms an integral part of the EMPR. It constitutes the legally binding document which must be approved by the Regional Director in terms of section 39 of the Minerals Act, 1991.

**EMPR:** The EMPR is a document which is developed to include the EMP and supporting information, and should include sufficient information to make the reader aware of the overall character of the mining area and its surroundings, the mining method, the likely impacts and how these impacts are to be managed. It is a comprehensive document comprising the various parts of the guideline document and must be submitted to the Regional Director for evaluation prior to the approval of the EMP.
Let us look with a critical eye at the EMPR. It is often said that it is not user friendly and that it is of a repetitive nature. It may seem so but let us analyse the Aide Mémoire a guideline for the preparation of environmental management programme reports for prospecting and mining. Remember there were very few formal guidelines before November 1992 and the Aide Mémoire is the result of negotiations, co-operation and consensus between the government departments, the mining industry and organised agriculture.

The Aide-Mémoire is there to assist and guide but it focus strongly on the format and contents of the compilation of a EMPR document and not the procedures and technical guidance. There are still many shortcomings - things missing in the Aide-Mémoire.

It is true that the present process, especially in the Gauteng Region, does not promote the speedy and effective evaluation of such programmes - but there are valid reasons for this situation. The EMP is tailored to the site specific mine and the concomitant environmental conditions. It is unnecessary to elaborate here on the complex environmental conditions in metropolitan areas.
4.1 Breakdown of EMPR

4.1.1 Executive Summary of the EMPR

4.1.2 Brief Project Description

Surely this is required as an introduction to get an overall picture of the proposed project, its impacts and the broad mitigation strategies.

4.1.3 Description of the Pre-Mining Environment

This may have been misleading for an operating mine which primarily has to describe the existing operation as this information may be difficult or impossible to obtain. (Who really knows what conditions were like 100 years ago?)

The emphasis should be on the impacts of the operating mine on an environment on which development has already taken place. Just describe the existing environment as it stated in the Aide Mémoire.

Experience since 1992 has proven that it is always wise to include more interested and affected parties than necessary. Involve the community at all levels - even in the environmental impact assessment. It is also
in accordance with the Integrated Environmental Management concept to "scope" as many parties as possible. Definition of "scoping" in IEM document:

Scoping: A procedure for narrowing the scope of an assessment and ensuring that the assessment remains focused on the truly significant issues or impacts.

It is unfortunately believed that public participation in pre-mining studies would expose mines to unreasonable demands. This statement is not necessarily true. In the majority cases public participation has little negative long term consequences. There are cases where the process of consultation was avoided and expensive and corrective measures became necessary once the affected parties became aware of the intended mining operations.

4.1.4 Motivation for the Proposed Project

Some of this information might be less important in a number of years' time - some might be confidential e.g. the expenditure. On the other hand mines, especially smaller operations, have gained tremendously by supplying this information. This section has specifically been
sustainable balance that the operation will create. The persons evaluating
the EMP have experience and knowledge in specific fields and such
information further enables them to propose alternative options such as
cheaper and safer mining methods, transport, land use options after
rehabilitation, waste management, storm water diversions, etc.

4.1.5 Detailed Description of the Proposed Project

From this detailed description the evaluating authorities will be able to
assess what the impacts on the environment will be. The interpretation of
the guide-line vary from mine to mine and either too little or too much
detail is supplied.

It may require intensive gathering of information and could be costly if
the information is not available as it should be. This information should
however be available as part of the normal planning and operation of a
mine. This gives a broad detailed picture of the intended mining
operation.
4.1.6 Environmental Impact Assessment (EIA)

As the environmental management process gets momentum the requirement for an Environmental Impact Assessment will increase. This is just one of the burdens emanating from the developments in environmental management, because we have now identified more and more potential problems - just think of ST Lucia, Noordhoek and Honey Dew.

Everyone, including the public at large, is getting wiser and are making more use of their constitutional rights in the new South Africa. This is merely a natural development in the world.

It is therefore essential that the potential or expected impacts are understood and considered by the mine.

4.1.7 Environmental Management Programme (EMP)

Although there is a criticism that there is duplication in the EMP, the various phases of the process must be distinguished and understood. Once the impacts have been identified their management and mitigation can be planned effectively.
This is the legally binding portion of the EMPR if we were in an ideal situation this should be all that is required, so why do we not merely ask only for Part 6 of the EMPR if this is sufficient.

Portion 6 of the EMPR might be the only requirement in many years' time. Then all the required information of a mine could be integrated in a massive country - or even world-wide, network. Unfortunately we are not by far so integrated and sophisticated at this stage.

We, the authorities as well as the mining industry, are still learning from each other. I foresee that the EMP will remain in more or less the same format for some time to come.

It is relatively easy to describe the construction phase and operational phase of the mine. The decommissioning and closure phases are problematic, especially with a mine with a 40 year life span. Again the emphasis should be on the impacts on the environment. But they must be aimed at the principles of the mine closure policy and this must be planned for!

The environment and economic conditions would change rapidly and frequently over the years. Therefore allowance had to be made for amendments to the EMP so that it remains dynamic and complete - this is a living document - from the cradle to the grave.
5. RESPONSIBILITY FOR AND FINANCIAL PROVISION BY NEW AND OPERATING MINES

5.1 In terms of section 38 of the Minerals Act, 1991, the rehabilitation of the surface of land concerned in any prospecting or mining operations shall be carried out by the holder of the prospecting permit or mining authorization -

(a) in accordance with an approved EMP;

(b) as an integral part of the mining operations;

(c) simultaneously with such operations, unless otherwise determined; and

(d) to the satisfaction of the Regional Director.

A statutory responsibility thus rests with such holder to rehabilitate the land concerned.

5.2 Section 9 of the said Act provides furthermore, that no mining authorization shall be issued unless the Regional Director is satisfied, inter alia, with the manner in which the applicant intends to rehabilitate and that he has the ability (including the financial ability) to rehabilitate, to the satisfaction of the Regional Director.

5.3 The adequacy of the applicant’s/holder’s financial provision includes that the Regional Director should be satisfied through the mechanism of the EMP that -
5.3.1 the applicant/holder will have the financial means to fulfil the requirements of the EMP;

5.3.2 there will be sufficient financial provision for the final closure of the mine;

5.3.3 such funds are protected from seizure; and

5.3.4 the financial provision made to fulfil the requirements of the EMP, will be utilized solely for rehabilitation until a certificate in terms of section 12 of the Minerals Act, 1991 (closure certificate), has been issued.

5.4 Financial provision shall be by way of one or more of the methods which are described in more detail below. The holder of the prospecting permit or mining authorization may choose the method(s) of funding which is considered most appropriate for the circumstances. Such choice shall, within the EMP process, be to the satisfaction of the Regional Director in regard to its viability. The methods for financial provision shall be the following:

6.4.1 Approved contributions to a dedicated trust fund as provided for in section 10(1)(cH) of the Income Tax Act, 1962, and/or
5.4.2 the submission of a guarantee by an acceptable financial institution in which the institution guarantees the availability of an acceptable sum of money payable on demand to the Department, and/or

5.4.3 any other arrangement which is approved by the Director-General of the Department of Mineral and Energy Affairs.

6. INTERESTED AND AFFECTED PARTIES

The Government’s policy is participation and transparency.

In some cases there are up to 27 interested and affected parties that are consulted in the process of approving the Environmental Management Programme.

It is obvious that this causes a long drawn-out problem. But why is this necessary? Section 39(3) of the Minerals Act requires that the Regional Director shall consult with each Department charged with the administration of any law which relates to any matter affecting the environment. The reason is that we do not have all the knowledge in the Department and to make certain that a holistic approach is followed, we must consult.
I agree that this is very wide. Affected parties are often frustrated neighbours who have hidden agendas. How wide is this consultation? To quote advocate Duard Barnard: "The wider the consultation the more representative it is". A judge in a civil court can on the other hand, only decide on the evidence before the court where the Department of Mineral and Energy Affairs has the discretion to involve more evidence in order to make better decisions.

Of course this process takes longer but the end result is far better as well as improved. The more public participation of affected parties, the more satisfactory is the end result.

7. CLOSURE CERTIFICATE

This could in many cases be a nightmare for mining companies.

Since the advent of mining in South Africa, some regulatory measures have been in existence for the mining industry to protect and conserve the environment. Legislation dating from 1903 placed responsibilities in this regard on the owner of a mine until such time as the owner has been issued with a certificate releasing him from such responsibilities. Current applicable legislation, being the Minerals Act, 1991, provides in section 12 thereof, that if any prospecting permit or mining authorization is suspended, cancelled or abandoned or if it lapses in terms
of the Act, or if any portion of the land comprising the subject of such permit or authorization is abandoned or the operations at a works cease, the person who was the holder of such permit or authorization immediately prior to such suspension, cancellation, abandonment or lapsing or the holder of such permit or mining authorization or the owner of such works, as the case may be, shall remain liable for complying with the relevant provisions of the Act until the regional director issues a certificate to the effect that the said provisions have been complied with.

7.1 Objectives of Mine Closure

Mine closure should ensure that:

7.1.1 The safety and health of humans and animals are safeguarded from hazards resulting from mining operations

7.1.2 Environmental damage or residual environmental impacts are minimized to such an extent that it is acceptable to all involved parties.

7.1.3 The land is rehabilitated to, as far as is practicable, its natural state, or to a predetermined and agreed standard or land use which conforms with the concept of sustainable development.
7.1.4 The physical and chemical stability of the remaining structures should be such that risk to the environment is not increased by naturally occurring forces to the extent that such increased risk cannot be contended with by the installed measures.

7.1.5 The optimal exploitation and utilization of South Africa's mineral resources are not adversely affected.

7.1.6 Mines are closed efficiently and cost effectively.

7.1.7 Mines are not abandoned but closed in accordance with this policy.

8. STATUTORY BODIES INVOLVED IN THE CLOSURE PROCESS

It is a requirement of section 39(3) of the Minerals Act, 1991, that the regional director of the Department of Mineral and Energy Affairs shall consult with each department charged with the administration of any law which relates to any matter affecting the environment before he approves any EMP or grants any exemption or extension of time or any temporary authorization that the prospecting or mining operations concerned may be commenced with.
The Department of Mineral and Energy Affairs will similarly execute the function of the lead agent with regard to matters concerning the issuing of a certificate in terms of section 12 of the Minerals Act, 1991.

This is again time consuming but necessary for ensuring that the area is rehabilitated in the best possible way.

9. **CESSATION OF OPERATIONS**

9.1 Section 54 of the Minerals Act, 1991, requires the holder of a prospecting permit or a mining authorization to notify the regional director concerned in writing at least 14 days before he intends to cease operations temporarily or permanently, and to provide particulars in connection with the location, nature and extent of the operations. Notice of such intent shall be regarded as the commencement of the decommissioning phase of a mine and an environmental assessment shall be carried out by the mining company in consultation with the regional director concerned in order to confirm or adapt the decommissioning strategy and closure objectives described in the EMP.

9.2 Mines which ceased operations before or during the transitional period allowed by the Minerals Act, 1991, with no intention of resuming mining operations, are required to comply with regulations regarding safety and health, pollution
prevention and the demolishing of buildings, structures, etc. at closure, and, furthermore, must obtain a certificate in terms of section 12 of the Act. These mines need not obtain a mining authorization and hence need not compile and submit an EMP for approval. In the absence of an EMP, it is required that a closure plan be drawn up by a mine in consultation with the regional director. Selected elements of the Aide Mémoire, as agreed to in consultation with the regional director, shall be used as a basis for the compilation of this plan. The closure objectives shall be clearly defined therein.

Mine closure incorporates a process which start at the commitment of mining and continue throughout the life of the mine. It should be executed within the framework of sustainable development.

Is the criticism on the necessity to obtain a closure certificate warranted? Legislation dating from 1903 placed responsibilities in this regard on the owner of a mine until such time as the owner has been issued with a certificate releasing him from such responsibilities. These responsibilities were not always enforced by the authorities. With hind sight one can definitely argue that our new and more stringent legislation came years too late.
10. FUTURE DEVELOPMENTS

10.1 Self Regulating

EMPR’s are mandatory but the incapacity to administer this system effectively could become a serious impediment. These are the practical realities.

Various mining groups are starting to implement self-regulating environmental management systems such as ISO-1400 (International Standards Organisation) in order to conform to international standards. But this does not make command and control from the State redundant. A mixture of the two is required. Regulations in this respect of monitoring and auditing will be forthcoming in the near future.

10.2 New Environmental Policy

According to Dr Cameron, Director General of the Department of Environmental Affairs, South Africa needs a new environmental policy, even if we have a policy that was promulgated as recently as 1994. There is a need not only to overhaul what we have, but to produce a totally new paradigm in which human needs feature prominently.
The Department of Environmental Affairs and Tourism, *in conjunction with international assistance*, has embarked on a comprehensive consultation process, which includes the Department of Mineral and Energy Affairs, to produce a White Paper.

It is of paramount importance that the experience and knowledge gained through the EMP process be accommodated in the new Environmental Policy.

10.3 Revision of the Aide Mémoire

Preliminary work is in progress to re-write the Aide Mémoire. This is an ongoing process. What is deficient is not the contents but what was omitted.

10.4 Developing a New Culture

In order to survive we are forced to manage the environment. As can be expected economics is still of paramount importance but if we do not develop a new culture as far as the environment is concerned we will end up in a bottleneck situation. It is pleasing to see that in even the lower grades in school children are stopping wastage and are re-cycling. I am sure that in time we will measure whatever we are doing on the impacts it will have on the environment. But do we have the time to wait for the new generation to grow up? - No we must immediately change our attitudes and views.
10.5 Environmental Impact Assessments (EIA)

At present the Director General *may*, pending the approval of an EMPR, require that an EIA be carried out by a professional body, if the EMPR submitted is not up to the standard required in the case of e.g. a sensitive environment.

10.6 Appointment of the Environmental Officers

The proper management of the environment is becoming so vital that in many cases the appointment of a full-time environmental officer is to be considered. In certain cases a proviso should be that such an appointed officer devotes all his time to the functions assigned to him.

10.7 Streamlining of EMP’s

At present guidelines for EMP’s are being drafted by the Department of Mineral and Energy Affairs, Water Affairs and Forestry, Agriculture, Environmental Affairs and Industry. These programmes are mostly for smaller mines with low impact and not in sensitive areas. Examples are the following.
1. Precious stones, diamond diggings.
2. Mining/crushing of rock at waste rock diggings.
3. Alluvial gold deposits.
4. Prospecting (diggings excluded).
5. Minimum requirements for granite mines (dimension stones).

10.8 Holistic Regional Approach

A problem with EMP's is that it is site specific. Each individual mine tends to address only the problem in its own area, i.e. the gold mines in East Rand, West Rand or Carletonville areas. The only real solution to the environmental problems, i.e. water, lies within an holistic regional approach. That will take cognisance of the individual as well as the region. After the unification of the two Germanies, the KATBO system was eventually developed and, in order to survive we could also be forced into a holistic integrated regional approach.

11. CONCLUSION

We were faced with tremendous environmental problems due to the legacy of the past.
Taking into account that the majority of us only began to take the protection of the environment seriously in 1992 we have probably done more environmental rehabilitation than our fathers and grandfathers together. In the future we will surely do even more. Our task is only beginning and many aspects will have to be adapted as our experience and knowledge grows.

REFERENCES

In preparing this paper information was obtained from various persons e.g.:

Mr C Hoek - Regional Director: Gauteng Region, Department of Mineral and Energy Affairs.

Adv Duard Barnard - Environmental Consultant.

Several other persons in the Department of Mineral and Energy Affairs.

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