

**A CRITICAL REVIEW OF THE ENVIRONMENTAL IMPACT ASSESSMENT
SYSTEM IN SOUTH AFRICA BASED ON CASE STUDIES AND A
LITERATURE REVIEW**

by

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COMPONENT A

ABSTRACT

This study represents a review of the Environmental Impact Assessment (EIA) system in South Africa based on case studies. It takes the form of two separate but interrelated components.

Component A sets out the rationale for the research, the approach and objectives, a conceptual framework and a statement of methodology. These aspects are supported by a detailed literature review. It is stated as the broad rationale of the research to determine whether the current EIA system can be improved. This is approached through an update on EIA reviews. It is not only the intention of the review to fill an existing gap in literature on the subject, but also to provide findings and recommendations on procedure that may positively contribute to the system and by implication, the process of EIA in South Africa. Certain objectives are realised in the literature review. An understanding of the review process in the context of EIA in South Africa is provided in sections on relevant terminology, the history and *status quo* of environmental assessment in South Africa as well as local and international experiences. Finally a framework is proposed for purposes of review. In order to ensure international relevance this framework uses as its basis the international best practice review criteria of Glasson, Therivel and Chadwick (1999) and Fuller (1999). This basis is amalgamated and extended with local review criteria contained in the White Paper on Environmental Management Policy, July 1997, the Guideline Document on EIA Regulations, April 1998 and the Integrated Environmental Management Information Series (2002-2004). The following review categories are used:

Description of the environment; screening, scoping, consultation and impact identification; prediction and evaluation of impacts; mitigation and monitoring; non-technical summary; organisation and interpretation of information and the appropriateness of institutional controls.

Ratings are allocated according to five different responses (non-compliance, low compliance, moderate compliance, high compliance and full compliance).

Ratings of non-compliance and low compliance also serve as an indication of key improvement areas.

The review framework that is proposed in Component A is used in Component B to conduct an in-depth analysis of two cases studies representing different environmental authorisation applications in the South African medical incineration sector. The case studies are reviewed by allocating numeric values to respective criteria and comparing ratings allocated to the respective case studies. All review categories, with the exception of the category dealing with institutional controls, are allocated ratings of low compliance. Both case studies are allocated similar ratings with regard to all review categories. These results suggest low overall quality and ample room for improvement on most aspects of EIA in South Africa. The results are discussed by relating it to possible explanations and corresponding recommendations found in relevant literature. It is suggested that the realisation of these recommendations may lead to the improvement of quality in EIA in South Africa.

It is the purpose of the study to review environmental impact assessment, thus the broad scope for review criteria. Due to practical constraints two case studies were used. The number of case studies does not allow for provincial comparisons as was initially envisaged. The significance of this study is found in the introduction and piloting of a comprehensive review framework. The application of the review framework on a provincially representative selection of case studies could, therefore, become the focus of subsequent research.

FULLER, K. 1999. Quality and Quality Control in Environmental Impact Assessment in PETTS J. (ed). 1999. Handbook of Environmental Impact Assessment. Oxford (England).

GLASSON, J. Therivel, R. and Chadwick A. 1999. Introduction to Environmental Impact Assessment Principles and Procedures, Process, Practice and Prospects (2nd ed.). London: UCL Press.

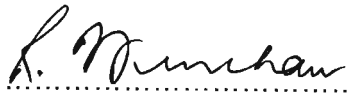
PREFACE

The research described in this mini-dissertation was carried out at the Centre for Environment Agriculture and Development, University of KwaZulu-Natal, Pietermaritzburg, under the supervision of Dr Nevil Quinn and Prof Rob Fincham.

This mini-dissertation represents the original work of the author and has not otherwise been submitted in any form for any degree or diploma at any university. Where use has been made of the work of others it is duly acknowledged in the text.


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I would also like to thank Ms Faith Nzimande from the Centre for Environment and Development for the vital co-ordinating and supporting role that she has fulfilled for the full duration of the study.

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GLOSSARY OF ABBREVIATIONS

DEAT	Department of Environmental Affairs and Tourism
EA	Environmental Assessment
EIA	Environmental Impact Assessment
ECA	Environment Conservation Act, 73 (Act No. 73 of 1989)
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ES	Environmental Statement
EM	Environmental Management
IEM	Integrated Environmental Management
I&AP	Interested and Affected Parties
IAR	Impact Assessment Report
NEMA	National Environmental ^{Management} Assessment Act, 1998 (Act No. 107 of 1998)
NEPA	United States National Environment Policy Act
NGO	Non-governmental Organisation
SSP	Saldanha Steel Project
WPEMP	White Paper on Environmental Management Policy

1. INTRODUCTION

1.1 BACKGROUND

Integrated environmental assessment in South Africa is a relatively new and developing science, as opposed to the longer established environmental assessment practices in countries such as the United States of America, Australia, Canada and New Zealand. Previously environmental sensitisation and consciousness in South Africa mainly manifested through a variety of indicators such as departmental and other reports, governmental White Papers, the reports of commissions of inquiry, parliamentary debates and respective legislation (Fuggle & Rabie, 1992). South Africa passed its first environmental framework statute in 1982, being the Environmental Conservation Act, 1982 (Act No. 100 of 1982). Glazewski (1999:1) argues that this legislation "...was not particularly effective its stated purpose being to co-ordinate environmental matters within government and did not include any substantive provisions regarding environmental assessment".

It was repealed and replaced by the Environment Conservation Act, 1989 (Act No. 73 of 1989). It was only with the promulgation of this Act (Act No. 73 of 1989) that an integrated approach towards environmental assessment in South Africa started to emerge. Van Viegen (1998:1) refers to this Act as "...the most important piece of environmental legislation in South Africa dealing with environmental matters in a holistic manner".

The integrated and holistic qualities of the Environment Conservation Act, 1989 (Act No. 73 of 1989) were further advanced through the release of a White Paper on Environmental Policy in 1997. This document projects the vision of an integrated and holistic management system for the environment aimed at achieving sustainable development now and in future (DEAT 1997).

Regulating mechanisms such as Regulations R. 1182 and R. 1183 under the Environment Conservation Act, 1989 (Act No. 73 of 1989) were published on 5 September 1997 in Government Gazette No. 18261. These regulations provide for the implementation of Section 21 (the identification of activities

which will probably have a detrimental effect on the environment), Section 22 (the prohibition of undertaking of identified activities) and Section 26 (regulations regarding environmental impact reports) of the Environment Conservation Act, 1989. These regulations were since repealed.

A guideline document on these regulations was released in April 1998 (DEAT 1998). The publication of this document stemmed from a specific need that was identified during a participatory process that preceded the publication of these regulations (DEAT 1998). It does not serve as substitute for the provisions in terms of Sections 21, 22 and 23 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) but is intended to serve an educational purpose (DEAT 1998).

The National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended provides for co-operative environmental governance. Regulations R. 385, R. 386 and R. 387 of 21 April 2006 in terms of this Act replaced Regulations R. 1182 and R. 1183 of 5 September 1997. The implementation of these regulations shall in all probability provide this Act with the title of the most important piece of environmental legislation in South Africa dealing with environmental matters in a holistic manner.

Various observations and statements found in recent literature on the subject suggest that the South African integrated environmental assessment process may still be open to improvement:

With regard to aspects of screening, scoping, consultation and impact identification Parkin and Freeman (2001) express the fear that scoping, though democratically fashionable, often stands in the way of much needed service delivery. Du Toit (2000) expresses concern over consultation processes that often only protect the interests of a few. Grobler, Custer, Bredenkamp and Brown (2001:4) focus on the role of specialist studies and venture that specialist assessments of vegetation as it is presently done, does not provide adequate information for decision-makers to adequately assess the impact on vegetation.

The prediction and evaluation of impacts are considered by Winter and Hurt (2000) and the conclusion is drawn that present environmental evaluation methods used in South Africa reveals "... a lack of a structured methodology for assigning relative significance values to potential impacts".

With regard to the appropriateness of institutional controls Claassen (2000:5) mentions the "... undemocratic - technocratic nature of the sections 21 – 26 regulations", thereby referring to Regulations R. 1182 and R. 1183 under the Environment Conservation Act, 1989 (Act No. 73 of 1989). Shroyer (2000:3) also expresses concern regarding these regulations, but then in particular over "... a lack of focus on conservation of wilderness and wildlife".

As far as implementation is concerned, De Wit (2001:2) argues that "... South Africa, despite a well-developed environmental legislative context, does not have the capacity or the institutions to implement these regulations". De Wit (2001:2) further argues that "... trade-off models do not receive the explicit attention they deserve in environmental assessments in South Africa".

In the field of mitigation and monitoring Cubitt and Diab (2001:8) point out that "... often EIA places greatest emphasis on the stages leading up to the Record of Decision, with little concern for the monitoring and auditing of impacts". Katzchner (2001:8) concurs with this opinion as follows: "Much focus to date, in response to legislation, has been on the project specific EIA, and focus thus has been up to and no further than the decision on a project. This is a very partial linear process, with little opportunity for a cyclical learning process". In the opinion of Barker and Hill (2000:1), "... in South Africa, EMPs are not always properly implemented in practice (if at all) in construction projects".

Against this background of criticism, the White Paper on Environmental Management Policy, dated July 1997, states as one of its supporting objectives the development of "... transparent review processes for all aspects of environmental management" (DEAT 1997:33). Given the relationship that is frequently drawn between review processes and improvement (Fuller 1999), these review processes may *inter alia* lead to the identification of key improvement areas that may serve as input to improve the

process. It may further be argued that the specific reference to “all aspects” implies that a holistic approach towards review is being implied.

The literature review that has been conducted for purposes of this study shows that a number of reviews of integrated environmental assessment in South Africa had already been undertaken. It further transpires that most of these reviews tend to concentrate on specific aspects of EIA and not “all aspects” as referred to in the White Paper on Environmental Management Policy, dated July 1997.

Certain exceptions to this tendency exist. The work of Mafune, Mclean, Rodkin and Hill, (1997) provides an example of a case study review that attempts to cover the broad spectrum of early South African EIA. Review criteria are based on a broad understanding of the term ‘environment’, informed decision-making, accountability for decisions and for the information on which they are based, an open, participatory approach in the planning of proposals and pro-active and positive planning.

Wood (1999a) reviews the South African EIA system against a comprehensive set of evaluation criteria. These relate to legal basis, coverage, consideration of alternatives, screening, scoping, EIA report preparation, EIA report review, decision-making, impact monitoring, mitigation, consultation and participation, system monitoring and costs and benefits.

The review criteria used in Wood (1999a) provides an elaborate reflection of the core components of EIA in South Africa and EIA practices elsewhere and therefore represents a valuable contribution to the field of South African EIA system review. At the same time a link between policy, theory and practice through the use of case studies or any other method is not provided. The study therefore does not reflect fully on aspects of implementation that can best be assessed through case study review.

1.2 PROBLEM STATEMENT AND DESCRIPTION

Regulatory environmental impact assessment with integral project review mechanisms has been operational in South Africa for more than seven years. In addition, the earliest voluntary environmental assessments in South Africa date as far back as 1971 (Mafune *et al.* 1997). The preceding background section also includes various observations and statements suggesting that the South African environmental impact assessment process may still be open to improvement.

The White Paper on Environmental Management Policy, dated July 1997, provides for the identification of key improvement areas that may serve as input to improve the process through the development of "... transparent review processes for all aspects of environmental management" (DEAT 1997:33). This is particularly relevant to the field of environmental impact assessment.

Although there is no shortage of review studies on environmental impact assessment in South Africa, most studies ((Mafune *et al.* 1997), (McDaid 2000), (Boer and O'Beirne 2002), (Jardine, Nijenhuis, Owen and Hill 1997), (Le Maitre, Euston, Brown and Gelderblom, 1997)) only concentrate on specific aspects of the process and do not represent "... transparent review processes for all aspects of environmental management" as referred to in the relevant White Paper. If considered on its own, these studies present little more than fragmented and single faceted reflections on a multi-faceted process. In certain reviews (see Mafune *et al.* (1997) and Wood (1999a) a more holistic approach has been adopted. However, certain considerations detract from the holistic and contemporary value of these studies. Although the use of case studies in Mafune *et al.* (1997) provide a useful link between policy, theory and practice, the five review criteria cannot be considered to represent a comprehensive reflection of the environmental impact assessment process in South Africa. Whilst the review criteria used in Wood (1999a) provide a more comprehensive reflection of the core components of EIA in South Africa and EIA practices elsewhere, a link between policy, theory and practice through the use of case studies or any other method is not

provided. In the case of both studies more than five years have since lapsed and a more contemporary review may prove useful.

In view of the above EIA review in South Africa can be said to consist of a number of review studies that only focus and make recommendations on specific aspects of the process, as well as a much smaller and dated number of holistically inclined EIA reviews linking policy / theory to practice.

This shortage and datedness of review studies reflecting on the entire implementation process of EIA in South Africa denotes a lack of reflection and feedback on the South African EIA system that in turn inhibits system improvement through corrective action.

It is believed that a critical review of the South African integrated environmental assessment system informed by standing policy and accepted review frameworks that are applied to actual case studies will provide a much needed holistic update on similar reviews such as that of Mafune *et al.* (1997) and Wood (1999b). The review will not only fill an existing gap in literature on the subject but it will also indicate the extent to which practice conforms to policy in EIA. Finally it is believed that the incorporation of findings and recommendations made in this review into procedure may positively contribute to the system and by implication, the process of EIA in South Africa.

1.3 AIM AND OBJECTIVES

It is the aim of this study to determine whether the current EIA system can be improved, on the basis of undertaking a literature review and analysis of relevant case studies.

The aim is achieved through the following objectives:

- To develop an understanding of the review process in the context of EIA in South Africa;
- to establish an appropriate review framework by drawing from local and international experiences, as part of a literature study;
- to conduct an in-depth analysis of two selected sectoral case studies through the application of an appropriate framework to contribute to the process of review of environmental impact assessment in South Africa;
- to make recommendations based on the findings of the analysis and recommendations considered in the literature review.

2. LITERATURE REVIEW

2.1. INTRODUCTION

In this chapter relevant and related terminology are reviewed in order to provide a proper context to concepts and terms that are used in the study.

Thereafter the regulatory framework for EIA in South Africa as well as existing reviews on the subject is examined in order to identify potential key components and criteria for a review framework. International environmental assessment and environmental assessment review frameworks are also discussed and considered for the same purpose.

This is followed by the introduction of an integrated review framework that can be applied to the two sectoral case studies. Such a framework will be based on local and international experiences. The selection criteria of case studies also receive consideration in this section.

2.2 TERMINOLOGY

2.2.1 Environment

An understanding of the term “environment” is critical to a study in the field of environmental assessment. The frequent use of the term “environment” in this study also merits closer examination of its possible meaning.

Table 7.1 contains different definitions for the term “environment”. Paehlke (1995) places emphasis on the spatial dimension of the term by referring to the area surrounding or circumscribing human or non-human beings. Fuggle and Rabie (1992) concentrate on the relational dimension of the term, and then in particular the interrelationship and interdependence between man and his surroundings. The distinction between man and everything else suggests a central role for man in its environment. Kemp (1998) refers to the interchangeable nature of an environment by relating it to a combination of the physical and biological elements that affect the life of an organism.

None of the quoted definitions are mutually exclusive but rather reflect on different but equally important dimensions of the same phenomenon. In order to recognise these different dimensions the term “environment” may be referred to as the surroundings within which humans exist and relate, consisting of a combination of physical and biological elements.

Table 7.1: Definitions of the term “environment”

“In its most general sense the word ‘environment’ refers to the area that surrounds or circumscribes human or non-human beings” (Paehlke, 1995:217).	“Environment is a relational concept; it denotes an interrelationship between man and his surroundings” (Fuggle and Rabie 1992:4)	“A combination of the various physical and biological elements that affect the life of an organism” (Kemp 1998:127).
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2.2.2 Environmental Management

An understanding of the term “environmental management” is important since this study takes place within the context of environmental management.

Claassen (2000:1) refers to environmental management as “... all systems that impact on the shaping of the total environment, natural and human”.

Fuggle and Rabie (1992:3) refer to environmental management as “... the execution of planned controls so as to achieve a desired outcome”. They also provide the following list of desired outcomes:

- Respect and care for the community of life;
- the improvement of the quality of human life;
- the conservation of the earth’s vitality and diversity;
- the conservation of non-renewable resources;
- the alignment of personal attitudes and practices;
- the provision of a framework for development and conservation;
- the creation of a global alliance.

Both definitions suggest a systemic approach towards the environment, whilst an equally strong normative element is also present. Whilst Claassen (2000:1) only suggests that the shaping of the total environment is required, Fuggle

and Rabie (1992:3) also elaborate on the desired outcome of such a shaping process.

2.2.3 Environmental Assessment (EA), Environmental Impact Assessment (EIA) and Integrated Environmental Management (IEM)

Environmental assessment manifests itself in various broad and country specific meanings. Table 7.2 contains some of these interpretations. It is important for purposes of the study to be able to distinguish between these respective interpretations in order to avoid confusion.

Nel and Du Plessis (2003:3) warn against confusion regarding the term integrated environmental management (IEM) by stating that "... the term IEM is, in the absence of clear direction, interpreted and used to mean different things".

To illustrate this point the following interpretations and uses of the term IEM are provided (Nel and Du Plessis 2003):

- IEM as a synonym for environmental impact assessment (EIA);
- IEM as meaning integrated environmental governance, i.e. the alignment of currently fragmented and disjointed environmental governance effort by numerous organs of state operating in different spheres of government;
- IEM as meaning adoption of the NEMA principles and tools by other organs of state in line with the duty of co-operative governance, and
- IEM as meaning the adoption of a holistic and integrative consideration of numerous parameters to inform planning and decision processes.

The adoption of a holistic and integrative consideration of numerous parameters to inform planning and decision processes is the interpretation provided by Nel and Du Plessis 2003 that most closely resembles the definition provided for IEM in Table 7.2. The "parameters" referred to in the

interpretation in turn consist of EA tools such as EIA, strategic environmental assessment, sustainability assessment and risk assessment.

Table 7.2: Environmental Assessment (EA), Environmental Impact Assessment (EIA) and Integrated Environmental Management

Environmental Assessment (EA)	Environmental Impact Assessment (EIA)	Integrated Environmental Management (IEM)
<i>Broad meaning</i>		
<p>"... the prediction of future changes in environmental quality and the valuation of these changes. The purpose of environmental assessment is to provide decision makers with guidance for making informed trade-offs among conflicting aspects of environmental quality and between environmental quality and other societal objectives" Hyman and Stiffler (1988:5).</p> <p>"It is a term that is being used and described in the British Environmental Assessment Regulations 1988 as the whole process required to reach the decision, from the initial collection of information to the consideration of that information by a number of sources, including the developer, statutory consultees and other third parties". Selman (1992:145-146).</p>	<p>"... the administrative or regulatory process by which the environmental impact of a project is determined" (Fuggle and Rabie 1992:763-764).</p> <p>"... the evaluation of the effects likely to arise from a major project (or other action) significantly affecting the natural and man-made environment" (Wood 1999b).</p> <p>"Assessment and analysis of the potential impact of various forms of human activities on the environment" (Kemp 1998:128).</p>	
<i>Country specific meaning (South Africa)</i>		
<p>"... the generic term for all forms of environmental assessment for projects, plans, programmes or policies. This includes methods / tools such as EIA, strategic environmental assessment, sustainability assessment and risk assessment" (DEAT 2002:21).</p>	<p>"A public process, which is used to identify, predict and assess the potential environmental impacts of a proposed project on the environment. The EIA is used to inform decision-making (DEAT 2002:21).</p>	<p>"Integrated environmental management is a philosophy that prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development and decision-making process. (DEAT 2002:21).</p>

2.2.4 Screening and Scoping

Screening and scoping form an integral part of the environmental assessment process as illustrated by the generic environmental impact assessment model provided by Woods (1999b). It is therefore important to gain an understanding of these concepts since it will in all likelihood also form an integral part of any environmental assessment review framework to be used for purposes of the study.

Table 7.3 contains definitions of the terms “screening” and “scoping”. Based on these definitions the process of screening is used to determine the need for an environmental assessment, whilst the process of scoping is used to determine the extent of an environmental assessment. The process of screening is normally followed by the process of scoping unless an application is terminated during the screening period.

Table 7.3: Screening and Scoping

Screening	Scoping
"Determination of whether an EIA is necessary for a particular development" – Wood 1999a:1).	"Deciding on the coverage of EIS" (Wood 1999a:1)
"A decision-making process to determine whether or not a development proposal requires environmental assessment, and if so, what level of assessment is appropriate. Screening is initiated during the early stages of the development of a proposal" (DEAT 2002:23).	"The process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an environmental assessment. The main purpose of scoping is to focus the environmental assessment on a manageable number of important questions. Scoping should also ensure that only significant issues and reasonable alternatives are examined" (DEAT 2002:22).

2.2.5 Environmental Impact Report (EIR), Environmental Statement (ES) and Environmental Impact Statement (EIS)

Table 7.4 contains definitions of an Environmental Impact Report (EIR), Environmental Statement (ES) and Environmental Impact Statement (EIS). Although these documents have different names and are products of different environmental assessment processes, they are all defined in law by the respective countries. Their relevance for review is that their legal definition and content requirement provides a first set of criteria for review.

Since the study concentrates on the South African EIA process, the Environmental Impact Report (EIR) will in all probability be most relevant to the study.

Table 7.4: Environmental Impact Report (EIR), Environmental Statement (ES) and Environmental Impact Statement (EIS)

Environmental Impact Report (EIR)	Environmental Statement (ES)	Environmental Impact Statement (EIS)
"An environmental impact report is a document that may be required as part of the South African EIA process in terms of the Environment Conservation Act, 73 of 1989" (Fuggle & Rabie 1992:109).	"The Environmental Statement is a document required in terms of the British Environmental Assessment Regulations 1988, and comprises information gathered by the developer and put forward in conjunction with the application" (Selman 1992:146).	In the United States the documentary reports resulting from a particular environmental analysis are termed an environmental impact statement. This component of the environmental assessment projects the process into the decision-making arena (Fuggle & Rabie 1992:764).

2.2.6 Monitoring, evaluation and review

Monitoring, evaluation and review form an integral part of the environmental assessment process as illustrated by the generic environmental impact assessment model provided by Woods (1999b). It is therefore important to gain an understanding of these concepts since it will also form an integral part of any environmental assessment review framework to be used for purposes of the study.

Selman (1992:140) as well as Wood (1999a:2) link monitoring to the measurement of impacts. Sadler (19988:130) relates evaluation to the generic process of analysis and interpretation that *inter alia* incorporates monitoring. Fuller (1999:57) and DEAT (2004:4) compare review to the determination of the adequacy of information. DEAT (2004:4) also refers to the role of independent parties in the process. These terms all form part of the EIA system and thus manifests in one form or another in the study.

Table 7.5: Monitoring, evaluation and review

Monitoring	Evaluation	Review
<p>"Monitoring is concerned with the identification and measurement of impacts from development.. It is a process of repetitive observation of one or more elements or indicators of the environment according to pre-arranged schedules in time or space" (Selman 1992:140).</p> <p>"Monitoring may be defined as the measuring and recording of relevant variables ... associated with development impacts (Glasson 1994 in Wood 1999a:2).</p>	<p>"Evaluation refers to the generic process of analysis and interpretation, and incorporates monitoring, surveillance and audit programmes. The process of evaluation involves making subjective policy-orientated judgements about the effectiveness of EIA procedures and results" (Sadler 1988:130).</p>	<p>"Review has been defined as the step in the EIA process by which it is ensured that environmental information on a proposed action is of sufficient quality and relevance and, in some jurisdictions, in which it is decided what the implications of the information are for decision making" (Scholten 1995 in Fuller 1999:57).</p> <p>"Review is quite simply the practice of having independent parties assess the work that has been done in the EIA to ensure that it is accurate, comprehensive and clearly represented" (DEAT 2004:4).</p>

2.3 ENVIRONMENTAL IMPACT ASSESSMENT IN SOUTH AFRICA

2.3.1 Introduction

According to Fuggle and Rabie (1992) concern for the protection of the environment is discernible from the earliest beginnings of the European settlement at the Cape of Good Hope. To this extent five 'placaats' were promulgated within five years of Van Riebeeck's arrival to protect gardens, land and trees from destruction. A prohibition on starting grass fires served the same purpose, as did control over the felling of trees for firewood and for timber. The following national attempts at environmental control and conservation in the early 1900s are also mentioned:

- The Irrigation and Conservation of Water Act, 1912 (Act No. 8 of 1912);
- The Forest Act, 1913 (Act No. 16 of 1913);
- The Public Health Act, 1919 (Act No. 36 of 1919);
- The National and Historic Monuments, Relics and Antiques Act, 1934 (Act No. 4 of 1934).

Van Viegen (1998) provides a comprehensive list of consequent legislation ranging from 1935 to 1988 that was targeted at various aspects of the environment. Environmental aspects targeted by these laws include the protection of water, air, soil, sea shores, defense areas, conservation areas, national monuments, mountain catchment areas, lake areas, national parks, coastal and marine environments, botanical gardens, forest nature reserves and state forests and marine reserves.

Fuggle and Rabie (1992) refer to the promulgation of these laws as an intensification of environmental concern that took place from 1940 to the 1980s.

In 1980 the White Paper on a National Policy Regarding Environmental Conservation was formulated. In 1982 the Environment Conservation Act, 1982 (Act No. 100 of 1982) was promulgated. The Act made provision for the co-ordination of all actions directed at, or which may have an impact on the environment.

Fuggle and Rabie (1992) mention that despite its all-embracing title, the Environment Conservation Act, 1982 (Act No. 100 of 1982) regulated only a few environmental aspects. It was consequently replaced by the Environment Conservation Act, 1989 (Act No. 73 of 1989) (ECA). Van Viegen (1998) refers to the ECA as the most important piece of environmental legislation in South Africa dealing with environmental matters in a holistic manner. The promulgation of the ECA was followed by the publication of the White Paper on Environmental Management Policy dated July 1997, the publication of Government Notices R. 1182 and R. 1183 of Government Gazette No. 18261 dated 5 September 1997 as amended, Guideline Document EIA Regulations of April 1998, the promulgation of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended and the publication of the Integrated Environmental Management Information Series (2002-2004).

2.3.2 The Environment Conservation Act, 1989 (Act No. 73 of 1989)

It is the stated purpose of the ECA, "(t)o provide for the effective protection and controlled utilization of the environment and for matters incidental thereto". The Act proceeds to realise this purpose as follows:

- The establishment of a policy for environmental conservation;
- the establishment of a Council for the Environment, Committee for Environmental Co-ordination and Board of Investigation;
- the protection of natural environments;
- the control of environmental pollution;
- the control of activities that may have a detrimental effect on the environment;
- regulations regarding waste management, littering, noise, vibration, shock, environmental impact reports, limited development areas and general regulatory powers;
- the description of offences, penalties and forfeiture.

Environmental impact assessment receives specific consideration in the section in the Act dealing with the control of activities that may have a detrimental effect on the environment. Sections 21, 22 and 26 provide the following platform for EIA in South Africa:

- The identification of activities that may have a substantial detrimental effect on the environment;
- the prohibition of undertaking of identified activities without a written authorization;
- the refusal or withdrawal of written authorizations;
- the establishment of regulations regarding environmental impact reports.

The Act provides for the identification of EIA activities and the publication of regulations regarding EIA procedures in that it empowers the Minister to make

regulations to that extent. It can therefore be seen as the enabling legislation for EIA in South Africa.

2.3.3 The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)

The new Constitution of South Africa Chapter 2 in the Bill of Rights states that, "Everyone has the right to an environment that is not harmful to their health or well being; and to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures....". In other words, environmental rights are equal to all other human rights.

Furthermore, Weilbach and Berry (1997) observe that the Constitution has broadened the basis for *locus standi*, which is the requirement in South African law for a litigant to prove a reasonable interest to institute legal action. The Constitution also gives potential litigants far greater rights of access to information than was previously the case.

The actual effect and significance of these provisions for environmental assessment in South Africa is that all subsequent environmental policy and law has the sole purpose of giving effect to people's right to a healthy environment

2.3.4 White Paper on Environmental Management Policy, July 1997

In its introduction the White Paper on Environmental Management Policy, July 1997 is presented as the government's national policy on environmental management. It sets out the vision, principles, strategic goals and objectives and regulatory approaches that government will use for environmental assessment in South Africa. The vision of this environmental management policy is one of a society in harmony with its environment. The policy advocates the following overarching principles:

- Accountability (government is accountable for policy formulation, monitoring and enforcement);
- allocation of functions (government will allocate functions within the framework of the Constitution to the institutions and spheres of government that can most effectively achieve the objective of a function within the context of environmental policy);
- alienation of resources (government must ensure that the alienation of resources will be done with circumspection);
- capacity building and education (all people must have the opportunity to develop the understanding, skills and capacity for the effective participation in sustainable development and resource use);
- conflict of interest (actual or potential conflicts must be resolved);
- co-ordination (environmental concerns affect all aspects of life and must be integrated into the work of all government institutions);
- cradle to grave (responsibility for the environmental and health and safety consequences of a process exists throughout its life cycle);
- demand management (in managing resources and environmental impacts, demand management must also be considered);
- due process (due process must be applied in all environmental assessment activities. This includes adherence to the provisions in the Constitution dealing with just administrative action and public participation in environmental governance);
- equity (equitable access to environmental resources, benefits and services to meet basic needs and ensure human wellbeing);
- environmental justice (to comply with the requirements of environmental justice, government must integrate environmental considerations with social, political and economic justice and development in addressing the needs and rights of all communities, sectors and individuals);
- full cost accounting (decisions must be based on an assessment of the full social and environmental costs and benefits of policies, plans, programmes, projects and activities that impact on the environment);
- good governance (good governance depends on mutual trust and reciprocal relations between government and people);

- inclusivity (environmental management processes must consider the interests, needs and values of all interested and affected parties in decision making to secure sustainable development);
- integration (all elements of the environment are linked and management must therefore take account of these connections);
- open information (everyone must have access to information to protect their health and wellbeing, protect the environment, participate effectively in environmental governance and comply with environmental policy, legislation and regulation);
- participation (government must include the inclusion of all interested and affected parties in environmental governance with the aim of achieving equitable and effective participation);
- precaution (government will apply a risk averse and cautious approach that recognises the limits of current knowledge about the environmental consequences of decisions or actions);
- prevention (government must anticipate problems and prevent negative impacts on the environment and on people's environmental rights);
- polluter pays (those responsible for environmental damage must pay the repair costs of preventive measures to reduce or prevent further pollution and environmental damage); and
- waste management (waste management must minimise and avoid the creation of waste at source, especially in the case of toxic and hazardous wastes. Government must encourage waste recycling, separation at source and safe disposal of unavoidable waste).

The principles contained in this document are important for the study and fully listed since it represents potential review criteria. The extent to which these principles have been incorporated into an appropriate review framework is discussed in the section on methodology.

2.3.5 Government Notices R. 1182 & R. 1183 of Government Gazette No. 18261, 5 September 1997 as amended

As was mentioned earlier the ECA empowers the minister to issue regulations regarding the identification of EIA activities and the publication of regulations regarding EIA procedures. Government Notices R. 1182 and R. 1183 of Government Gazette No. 18261, 5 September 1997 as amended serve as embodiment of this empowerment.

Government Notice R. 1182 of Government Gazette No. 18261, 5 September 1997 as amended relates to the identification under Section 21 of the Environment Conservation Act, 1989 (Act No. 73 of 1989) of activities which may have a substantial detrimental effect on the environment.

Government Notice R. 1183 of Government Gazette No. 18261, 5 September 1997 as amended relates to regulations regarding activities identified under Section 21 (1) of the Environment Conservation Act, 1989 (Act No. 73 of 1989). These regulations can be broadly categorised as follows:

- Responsibilities of applicant, relevant authority consultant and interested parties;
- compilation, submission and consideration of application;
- compilation, submission and consideration of plan of study of scoping;
- compilation, submission and consideration of scoping report;
- compilation, submission and consideration of plan of study for environmental impact assessment;
- compilation, submission and consideration of EIR;
- issuing of record of decision; and
- allowance for appeal.

2.3.6 Guideline Document EIA Regulations, April 1998

The Guideline Document EIA Regulations, April 1998 is aimed at providing the applicant, business and industry, NGO's, the public, labour organisations and the authorities on national, provincial or local government level with a uniform basis for implementing sections 21, 22 and 26 of ECA. It also provides background information regarding the legislation controlling environmentally harmful activities, assists applicants with the preparation, completion and submission of applications and required environmental report(s) and assists authorities in determining their roles and responsibilities as decision makers.

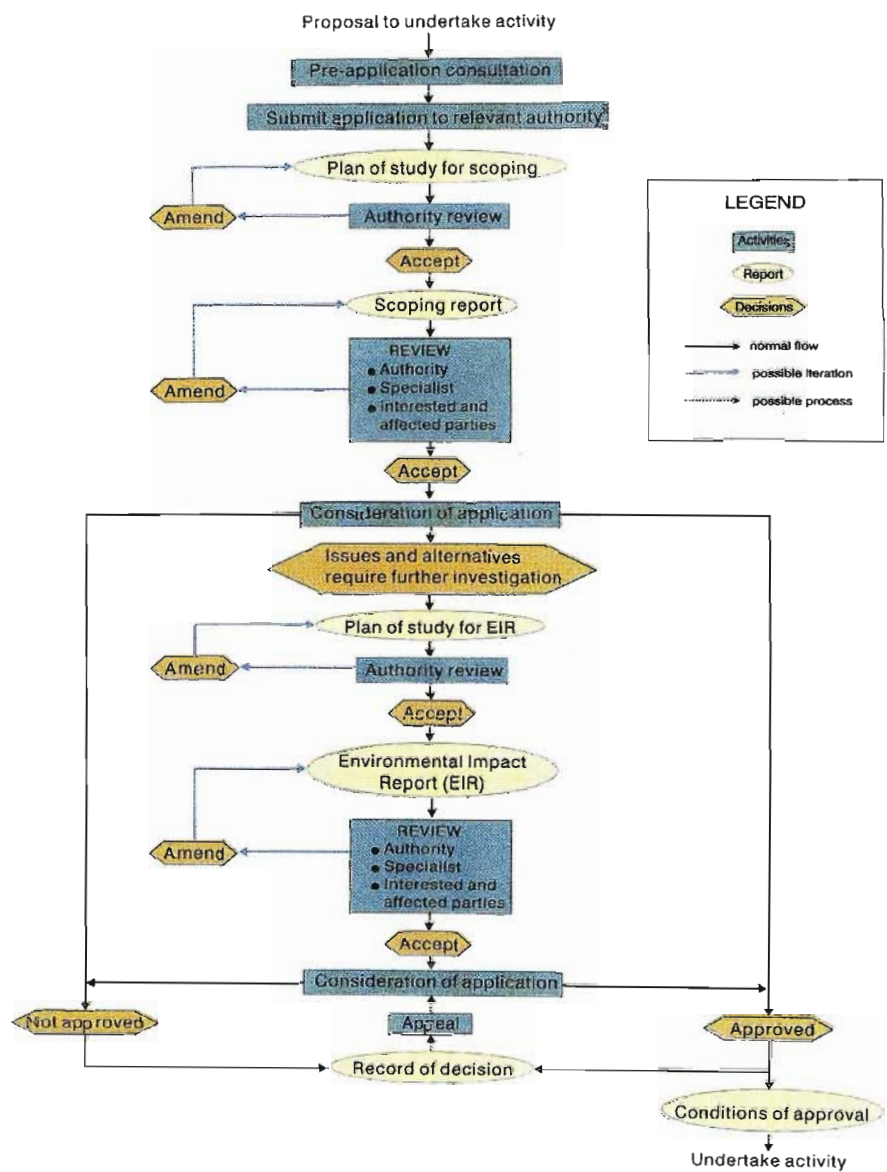
The document consists of an introduction, a description of activities and a description of regulatory guidelines.

The section dealing with regulatory guidelines is being categorised as follows:

- Application procedures;
- compilation, submission and consideration of plan of study for scoping;
- compilation, submission and consideration of scoping report;
- compilation, submission and consideration of plan of study for EIA; and
- compilation, submission and consideration of environmental impact report.

The above referred to categories do not only broadly correspond with the categories provided for in Government Notice R. 1183 of Government Gazette No. 18261, 5 September 1997 as amended, but also provide a broader context and more detailed explanation of the intention and scope of the regulations. It also contains a flow diagram of the application and EIA process that may prove useful in the finalisation of an appropriate review framework (refer to figure 6.1). Due to its descriptive and encompassing nature this document is used as reference for local review criteria in the section on methodology.

Figure 6.1: The application and EIA Process (DEAT 1998)



2.3.7 Integrated Environmental Management Information Series (2002-2004)

The Integrated Environmental Management Information Series consists of overview information documents on the concepts of, and approaches to integrated environmental management. These information documents have been published and distributed by the Department of Environmental Affairs and Tourism over a period of two years ranging from 2002-2004.

The following aspects of integrated environmental management are being covered in the series:

Overview of integrated environmental management; screening; scoping; stakeholder engagement; specialist studies; impact significance; ecological risk assessment; cumulative effects assessment; cost benefit analysis; life cycle assessment; strategic environmental assessment; alternatives in EIA; environmental management plans; review in EIA; environmental auditing; environmental impact reporting and environmental economics.

These information documents provide more comprehensive information and guidance than the Guideline Document EIA Regulations, April 1998 on the respective topics and are thus also used as reference for local review criteria in the section on methodology.

2.3.8 The National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended

In order to give special effect to the previously referred to environmental provisions contained in the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) Chapter 2 in the Bill of Rights, the National Environment Act, 1998 (Act No. 107 of 1998 as amended) was promulgated.

It is the stated purpose of this Act "... to provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state; and to provide for matters connected therewith".

Hamann (1999) considers the Act to be of the utmost importance in providing a launch pad between equitable development and environmental protection. In addition Claasens (2000) finds the strength of the Act not so much in the systems that it creates, but rather in the principles and processes that it prescribes – principles and processes that will apply to virtually all new physical and land use developments. Accordingly the most important elements of the Act as far as environmental assessment is concerned, are identified as the principles of Chapter 2 and the prescriptions for integrated environmental management of Chapter 5. At the macro level, the environmental implementation plans and management plans provided for in Chapter 3 are also considered to be of importance. Glazewski (1999:1) also stresses the importance of the Act by referring to it as "... the flagship statute of the Department of Environmental Affairs and Tourism ...".

De Wit (2001) refers to the current review of NEMA to include mainstreaming/integrating environmental aspects into planning and economic processes through all three spheres of government. In this regard Hamann (1999) observes that NEMA does not seek to replace those provisions relating to the appraisal of activities that have been promulgated under the Environment Conservation Act, but that it allows for the Minister or provincial MEC to promulgate new regulations that incorporate the NEMA's principles, thereby heralding the development of "second generation EIA regulations".

Proposed regulations under Section 24(5) of NEMA as amended have been published in Government Notice No. R.764 of 25 June 2004. According to a media release issued by the Department of Environmental Affairs and Tourism (DEAT 2004a) these regulations will:

- Streamline the EIA process by reducing the number of steps and/or interactions between the applicant and the authority to key interventions or provision of information;
- reduce the number of formal decisions required by officials;
- secure the provision of sufficient and adequate information by the applicant prior to decision-making;

- create flexibility regarding the entry point in the EIA process and undertaking of the process to ensure that officials are able to request only the information required for decision-making and avoid unnecessary steps and/or processes;
- reduce the administrative burden and potential for delays through the submission of incomplete or inferior reports by the applicant; and
- provide for sound decision-making through adequate information.

The draft regulations have been embodied in Regulations R. 385, R. 386 and R. 387 of 21 April 2006. These final regulations are yet to be operationalised and will therefore not be included in an appropriate review framework for purposes of the study.

2.4 ENVIRONMENTAL ASSESSMENT REVIEW AND QUALITY MEASUREMENT: LOCAL EXPERIENCES

2.4.1 Formal reviews and review processes

The Integrated Environmental Management Information Series 13: Review in EIA (DEAT 2004g) provides a description of review processes that are applied in the case of specific EIA applications and are closely associated with project specific EIA processes. These review categories are complemented by international sources such as UNEP (2002) and US EPA (2000) and may be loosely termed formal review processes for purposes of the study. It can in turn be divided into two categories. The first of these is the review category that forms an inherent part of the EIA process and that is effected by the different parties that participate in the process. Examples of this category of review include stakeholder review, decision-makers' review, review by other authorities, project proponent review and financiers review. The second category relates to reviews that are commissioned by the EIA practitioner to enhance the quality of the EIA and includes process review and technical review. For purposes of clarity each of these respective review processes will receive brief consideration.

2.4.1.1 Stakeholder review

The simplest form of stakeholder review is checking to ensure that issues raised by stakeholders have been acknowledged and addressed in the EIA. This may already take place during the scoping process where there is a check (as part of the decision-makers' review) to see that stakeholder views have been incorporated. Another example of a stakeholder review is a formal appeal by an I&AP after a Record of Decision has been issued. The form of review can vary from a simple statement of direct disagreement with the findings, to a structured argument that may require certain findings in the EIA to be revisited (DEAT 2004g). At an international level UNEP (2002) also refers to stakeholder review and the same attributes are allocated to this type of review.

2.4.1.2 Decision-makers' review

Decision-makers' review takes stock of whether specific authority requirements have been recognised and included in the assessment (for example regulations and by-laws), whether the EIA is technically robust and whether the required process has been followed and addressed adequately. There is a strong link between this review component and one of the more important characteristics of a good EIA, namely the provision of interpreted data for informed decision-making (DEAT 2004g). This review process takes place throughout the assessment process by the relevant authority when considering the application, plan of study of scoping, scoping report; plan of study for environmental impact assessment and the environmental impact report. US EPA (2000) also mentions this type of review and agrees in broad terms with DEAT (2004g) on its attributes.

2.4.1.3 Review by other authorities

While specific authorities are designated with the task of decision-making, there is a range of other authorities who may also provide comment and input to the EIA. These would include other government departments who are affected by the decision as well as other authorities who may need to issue

permits. It may even happen that different divisions in the same government department may review an EIA from different perspectives. Other authorities would typically review an EIA in much the same way as the decision-makers ensuring that relevant regulatory requirements have been recognised and addressed in EIA (DEAT 2004g). An example in this regard is the National Department of Agriculture reviewing an EIA application for the change of land use from agriculture to any other use in terms of the requirements of the Subdivision of Agricultural Land Act, 1970 (Act No. 70 of 1970).

2.4.1.4 Project proponent review

This form of review would focus on the accurate description of the proposed activity as well as the findings of the impact assessment. One of the key elements of a proponent's review is the assessment of the recommendations presented in the EIA to ensure that these are practicable and implementable (DEAT 2004g). An example in this regard will be the project proponent reviewing the conditions set out in the relevant Record of Decision.

2.4.1.5 Financiers' review

In the case of large developments there may be financiers involved who will also want to satisfy themselves that the EIA is accurate and comprehensive. Financiers review EIAs to ensure that they are of adequate quality, but also to ensure that they have included particular policy and procedural requirements (DEAT 2004g).

2.4.1.6 Process review

A process review is used to assess the degree to which the process requirements of an EIA have been met. Specific items to be addressed in a process review would include:

- Degree and adequacy of stakeholder involvement;
- opportunity to comment;
- adequacy of scoping;

- compliance with regulatory or other procedural requirements;
- appointment of specialists;
- quality control procedures (including peer review);
- methods of conflict resolution; and
- engagement with the authorities.

The principle of process review is to assess whether the EIA process has been fair to all involved parties. Process review is especially important in terms of regulatory compliance (DEAT 2004g).

According to DEAT 2004g an experienced EIA practitioner will be able to review a process ensuring that it meets legal and procedural requirements, as well as criteria for good practice.

2.4.1.7 Technical review

A technical review is used to ensure that the EIA is technically sound, that it has been competently performed, properly documented, and satisfies recognised quality requirements. In many instances a technical review takes the form of an independent peer review of the specialist studies. This type of review is a detailed assessment of the assumptions, calculations, extrapolations, alternate interpretations, methodology, acceptance criteria, and conclusions that have been used as the basis of the assessment, together with the supporting documentation (DEAT 2004g).

According to DEAT 2004g the requirement for independent peer review of all the specialist studies can seldom be met by a single individual. This is the case because of the diversity of disciplines that are normally found in an EIA. Independent reviewers may therefore be found for each of a range of specialist studies in a single EIA. The recommendation is made that peer reviews should be proactive and should start early on in the process with the peer reviewer becoming involved in the drafting of terms of reference for the respective specialist studies. US EPA (2000) also mentions this type of review and agrees in broad terms with DEAT (2004g) on its attributes.

2.4.2 Informal reviews and review processes

In addition to the formal review processes mentioned, various reviews of environmental impact assessment in South Africa are found in literature on the subject. These studies do not form part of formal review processes in that they rarely concentrate on only one individual EIA application at a time. It also does not form an inherent or associated part of the EIA process. More often than not it represents research on specific aspects of the EIA process in South Africa. In certain instances the EIA process and system is reviewed in part or in its entirety.

A number of studies are discussed so as to provide an indication of thinking and debate on the subject. Discussions are structured around common themes in order to encourage analysis, synthesis, comparison and contrasting. As far as possible themes are presented in the order that it takes place in the environmental assessment process.

The purpose of reviewing these studies is twofold. On the one hand it provides a useful literary reflection on the status of the various aspects of the environmental impact assessment process. On the other hand these reflections can be measured against the results obtained from the case study reviews in order to establish resemblances. In the case of corresponding weaknesses having been identified, recommendations listed by authors in the literature review may be submitted in the section dealing with recommendations.

2.4.2.1 *Description of environment and the role of specialist studies*

Boer & O'Brien (2002) review a number of specialist studies and conclude that the contribution of specialist studies to sustainable development requires improvement in all areas evaluated. They state as factors contributing to the current state of specialist input a reluctance to cross the discipline boundary, the lack of methodologies for inclusion of bigger picture effects in certain disciplines, the lack of training and limited demand for sustainable development based decisions. An urgent move from a discipline focus (such

as air quality and water quality) to an impact focus (such as human health) with regard to specialist input is suggested in order to promote sustainable development in the EIA process. It is further concluded that a fundamental change in mindset is required from mere reactive impact evaluators to active promoters of sustainable development. This may require specialists from time to time to cross disciplinary boundaries in order to assess the broader significance of evaluated impacts in terms of sustainable development. Le Maitre, Euston, Brown and Gelderblom (1997) add to the list of causal factors by mentioning inadequate terms of reference for specialist studies and a failure to co-ordinate and integrate specialist studies.

2.4.2.2 *Screening, scoping, consultation and impact identification*

Ballot and Jansen (1997) write that EIA's that are project specific, usually result in environmental issues being introduced at a stage in the planning process, where detailed plans have already been formulated. In other words, as early as the screening process, final project designs have already to a great extent been determined. The recommendation is made to include the consideration of alternatives as part of the pre-application and screening process.

Jardine, Nijenhuis, Owen and Hill (1997) relate to the observations of Ballot and Jansen (1997) by observing that the EIA procedure is not always diligently applied and that due consideration is rarely given to alternatives at an early stage in the development of a proposal.

According to Mafune *et. al* (1997) the domination of the scoping process by authorities reflects the 'top-down' approach to development adopted by the South African government.

In his evaluation of the strengths and weaknesses of the South African EIA system Woods (1999a) identifies public participation as a principal weakness. McDaid (2000) is more specific by providing a number of possible explanations for this weakness. Explanations range from process

manipulation by consultants with vested interests, a lack of a uniform public participation process and resultant public confusion to inadequate notification methods and logistical constraints experienced by interested and affected parties. Mafune *et al.* (1997) record relatively few case studies where I&AP involvement included full representation of all stakeholders, and ascribe it to the perceived "top-down" approach of government towards development.

Duma and Howard (1997) observe that while it is widely accepted that the key element in the preparation of the EIA in accordance with the EIA principles is public participation, this condition is not formally observed in the rural environment. This can be attributed largely to lower levels of literacy, poor socio-economic conditions and the lack of established mechanisms for public involvement. When expressed, public concerns are usually directed towards immediate problems which affect the socio-economic well-being of the community.

Le Maitre *et al.* (1997) express concern at the apparent inadequate prediction and evaluation of impacts. Their concern is in particular aimed at the inadequate assessment of functional biodiversity. They mention various possible causes, with the most important one being inadequate terms of reference for the specialist studies and a failure to co-ordinate and integrate specialist studies. It was also found that many interested and affected parties, and often the personnel leading environmental impact assessments, do not understand the full meaning of biodiversity, particularly the importance of functional biodiversity. Possible solutions include developing guidelines, similar to the existing lists of "environmental characteristics", to ensure that biodiversity assessments cover the important issues.

Mitchell, Kaatz and Quayle (2000) also recognize the tendency of the South African public participation process towards social differentiation by observing that the disadvantaged are often not well served by the process. They submit that in order to fully recognise and reflect the needs of disadvantaged communities, a greater level of cooperation not unlike a partnership is required between the EIA consultants and the I&AP's.

Totman, Murphy and Pollett (1997) find that EIA's are often incorrectly used to address the need for facilitation and negotiation. This is often caused by ignorance regarding the purpose of the process and can be alleviated through proper training and information sharing.

Du Toit (2000) focuses on a tendency by a privileged few to derail EIA processes that have been run competently by consultants for purposes of their own agendas and benefit. In these instances the EIA process and in particular the public participation process does not contribute to the socio-economic development of the greater community. She proposes that a social probe should be undertaken at the project initiation stage. This can serve to determine issues such as who the "public" is, how many groupings exist within the public, what their different priorities are, the level of education of that group and only then set up an appropriate public participation programme.

2.4.2.3 Prediction and evaluation of impacts

According to Ballot and Jansen (1997) the nature of project-specific EIA's is such that the important question of cumulative effects is not addressed. This is particularly true of large-scale development projects and where secondary development is likely to occur.

Van der Heyden, Ballance, Evans, Murphy, Van Tienhoven and Wade (1998) concur by referring to the poor incorporation of the cumulative effects philosophy in EIA. They propose the development of databases on relevant expertise as well as the introduction of awareness programmes.

Van der Heyden, Mitchell and Megown (1999) refer to a lack in competencies within South Africa to evaluate cumulative impacts, and propose the development of capacity in this field.

2.4.2.4 *Mitigation and monitoring*

Du Preez, Haynes and Paton (1997) observe that there is limited reference and guidance to steps for mitigation of impacts during the post-decision stage of a project. According to them this often results in decisions being made with respect to the most environmentally sound development options, and the identification of mitigation measures, without formal provision for the implementation of recommendations. They therefore recommend the integration of technically specific measures into environmental management plans for both construction and operational phases. By doing this it is envisaged that environmental assessment would become truly integrated with the technical aspects of any infrastructure and water resources development project, with environmental deliverables for technical aspects required at the completion of each project stage.

In his evaluation of the strengths and weaknesses of the South African EIA system Woods (1999a) identifies a principal weakness with regard to impact monitoring and EIA system monitoring.

In support of the observation of Woods (1999a), Shippey (1997) comments that the majority of environmental protection measures for projects in South Africa lack legal enforceability. This is the case since project co-ordinators and clients are often not under obligation to implement Environmental Impact Assessment (EIA) recommendations or the Environmental Management Plan (EMP). She recommends that the implementation of the EMP should become legally binding and should be included in the specifications for tender or negotiated contract in order to ensure that adequate time and finance is made available. She further recommends that the environmental control officer should preferably be the relevant independent consultant and should be independent of the developer. She also stresses the need for fines to be severe enough to deter certain actions.

Ira, Reid, Spinks and Blaine (2000) agree with Shippey (1997) on the necessity of having a legally binding EMP as part of a proposed development.

2.4.2.5 *Organisation and interpretation of information*

Greyling (2000) expresses concern over a lack of integration of public issues and technical assessment in EIA's. She ascribes this to a lack of understanding of the purpose and value of public participation, a lack of a common purpose among EIA team members, specialists viewing their work in isolation from other specialists in the team, team members not appreciating the value of local knowledge, public participation practitioners not understanding their responsibility as members of the EIA team and the respective mindsets and comfort zones of team members. According to Greyling (2000) true integration can only be achieved when project teams are committed to a common, well-defined purpose. It must be mutually understood that the roles of technical assessment and public participation are equally important, and that these team members should be mutually accountable for their efforts. Considerable joint, up-front planning and ongoing interaction within the framework of a common purpose are required. At the end of the day, the issues that were raised either by the public, the technical specialists, the proponent or the authorities, need to be clearly reflected in the findings of the EIA. And then, need to also be taken up in the Environmental Management Plan for the development.

2.4.2.6 *Appropriateness of institutional control*

Davies, Fraser and Burns (1998) identify certain constraints in EIA which presently do not permit the authorities to effectively perform their EIA review and decision-making roles. The ability of the relevant authorities to perform all of the responsibilities assigned to them by law at the level that the regulations require is in particular being questioned. It is proposed that review panels, comprised of specialists qualified with the necessary skills and expertise, could assist in overcoming some of these constraints. Having reviewed the EIA process and products, the panel submits a report to the relevant authority in which a recommendation is made regarding decisions that need to be taken. Such panels could also be used more broadly to assist relevant authorities by submitting recommendations regarding, for example, suitable

project alternatives, specialist studies required and public participation mechanisms. The relevant authority could be guided in its decision-making by these recommendations, thereby improving the quality and efficiency of decision-making.

Jordi, Kingwill and Scott (1998) expresses concern over the apparent dichotomy between the disciplines and practice of environmental and development planning in the South African context and the negative impact it may have on the effectiveness of relevant decision making processes. They observe that in spite of elements within the two professions sharing a common vision of integrated environmental planning, there are deep philosophical, methodological and professional differences that seem to hinder communication. This distance is reinforced by the political and legislative separation of environmental affairs from planning. They conclude that despite the intention of the 1992 EIA guidelines to facilitate the integration of environmental evaluation into the planning process, it is likely to remain a stand-alone procedure unless a wider political and legislative programme of integration is developed. In addition to the development of a programme of integration the continued development of postgraduate study programmes in holistic environmental planning at tertiary institutions is recommended.

Hamann (1999) refers to a certain amount of unfairness towards disadvantaged communities in formal public participation procedures and ascribes it in part to certain fundamental characteristics of project-level decision-making. He points out that Integrated Development Programme (IDP)-style procedures contain the potential for inclusive, integrated, and reconciliatory deliberation and that an engagement by environmental professionals in IDP processes, and a closer interaction between IDPs and project-level assessments are crucial. To this extent he supports and underlines the appeal of Jordi, Kingwill and Scott (1998) for closer integration between environmental and development planning.

Luger, Laidler and Shand (2000) highlight the issue of capacity constraint at relevant authority level and discuss the outsourcing of the EIA review function

as a possible short-to-medium term solution whilst increasing the capacity of the respective relevant authorities.

In their study, Luger, Laidler and Shand (2000) also question the credibility and “independence” of independent consultants if they are appointed and paid by the applicant, a concern that is also expressed by McDaid (2000). Luger, Laidler and Shand (2000) propose the use of peer reviews in order to promote the notion of independence.

2.4.2.7 *General*

Most of the reviews that were considered tend to concentrate only on specific aspects of the EIA process.

Certain exceptions exist. The work of Mafune, Mclean, Rodkin and Hill, (1997) provides an example of a case study review that attempts to cover the broad spectrum of early South African EA. The relevant review criteria are based on a broad understanding of the term ‘environment’, informed decision-making, accountability for decisions and for the information on which they are based, an open, participatory approach in the planning of proposals, and pro-active and positive planning.

Wood (1999a) reviews the South African EIA system against a comprehensive set of evaluation criteria. These relate to legal basis, coverage, consideration of alternatives, screening, scoping, EIA report preparation, EIA report review, decision-making, impact monitoring, mitigation, consultation and participation, system monitoring, costs and benefits and strategic environmental assessment.

2.5 ENVIRONMENTAL ASSESSMENT REVIEW : INTERNATIONAL BEST PRACTICE

2.5.1 Introduction

According to Glasson, Therivel and Chadwick (1999), environmental impact assessment was first formally established in the USA in 1969 and has since spread, in various forms, to other countries. Cosijn (2000) considers the United States Government's enactment of its National Environmental Policy Act (NEPA) on 1 January 1970 to represent a turning point in human-environmental relationships as well as an acknowledgement that human-environment relationships cannot be adequately addressed through piecemeal legislation which tackle problems on an *ad hoc* basis, but rather that a holistic approach was necessary. Although before the 1970s there had been elements of what is now termed environmental consciousness and although some environmental conservation work had been undertaken in many countries world-wide, it was really during this decade that the environmental movement started developing in earnest. Following on this landmark event in the USA, the 1970s became a decade of increasing environmental concern virtually throughout the world, and approximately half the nations of the world enacted some form of legislation for environmental protection. Glasson, Therivel and Chadwick (1999) refer to NEPA as an important model for other systems, both because it was a radically new form of environmental policy, and because of the successes and failures of its subsequent development.

Cosijn (2000) further argues that during the decades of the 1980s and 1990s these trends continued both on home fronts (as more comprehensive legislation was promulgated), and globally (as numerous international agreements/protocols on environmental matters were signed). A key achievement of this period was the coming to terms with the concept of sustainable development, namely an attempt to reconcile ecological and economic concerns and approaches. The eventual signing of Agenda 21 (essentially the blueprint for sustainable development) by 178 countries

(including South Africa) at the Rio Conference in 1992 reflected a global consensus and political commitment at the highest level to integrate environmental concerns into the social and economic decision making process.

According to Fuggle and Rabie (1992), environmental evaluations have become an established part of good development planning throughout the world. Sadler (1988) concurs with this observation by commenting that during the past thirty years, environmental impact assessment (EIA) has been adopted in various parts of the world in order to analyse and mitigate the effects of development proposals. Sadler (1988) further points out that, since its inception, a continued expansion in the role and scope of EIA has taken place. Whilst the initial focus of interest was on the methodology of impact prediction, it broadened to include the administrative procedures for EIA and now encompasses its relationship to the larger framework of resource management and development planning. Thus a new paradigm of EIA is emerging. One of its fundamental premises is that the impact assessment process requires two supporting provisions to work effectively. Firstly, a policy planning context, sufficient to permit an evaluation of the significance of potential impacts is needed. Secondly, an implementation management system is needed for monitoring, controlling and evaluating the effects of development. Equal emphasis should also be placed on follow-up activities, including research to measure performance against prediction and practice against intention in order to improve analysis and administration.

The above expansion of the theoretical framework and train of thought that underlies the EIA process can be interpreted as an acknowledgement that the respective components of the process cannot be viewed in isolation but rather, should be seen as an integrated whole. The policy planning process, the implementation management process and the monitoring process therefore are of equal importance.

This increasingly holistic approach towards EIA signifies a corresponding increase in the need for environmental assessment reviews that do not only concentrate on project regulatory aspects but also on implementation

management and monitoring aspects. An appropriate review framework should therefore encapsulate all of these aspects.

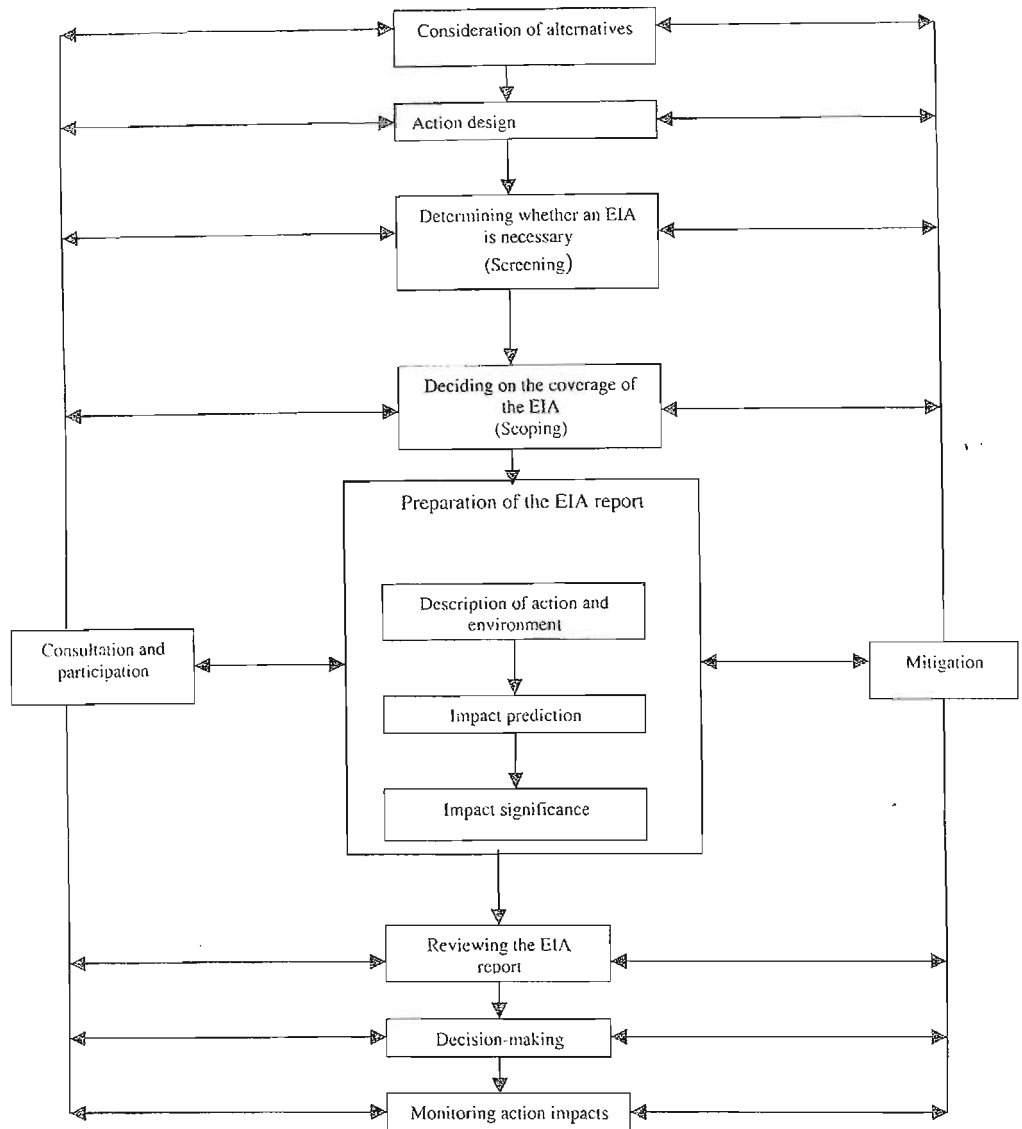
2.5.2 Generic attributes of environmental assessment

Selman (1992) observes that EA systems in both developed and developing countries tend to contain a large amount of very similar elements.

Wood (1999b) agrees that EIA processes around the world share the same series of iterative steps. He supports his observation with a generic EIA process typical of most EIA systems (Figure 6.2). A broad correlation exists between the process provided in Figure 6.1 for the South African EIA process and the generic process provided in Figure 6.2. The most significant difference between the two processes is the omission of monitoring action in the South African process. The consideration of alternatives also differs in sequence.

It is important to acknowledge the generic composition of EIA for purposes of review since it implies that review frameworks that may have been derived from a specific EIA system may be applied to another EIA system or even a number of EIA systems. It also allows for the integration of different review systems.

Figure 6.2: The environmental impact assessment process (Wood 1999b:11)



2.5.3 EIA review frameworks

2.5.3.1 Review criteria (Glasson, Therivel and Chadwick 1999)

Glasson, Therivel and Chadwick (1999) consider the comprehensiveness and accuracy of EIS's to be matters of concern. According to their research many EIS's do not meet even the minimum regulatory requirements, let alone adequate information on which to base decisions. One of the reasons for this state of affairs is given as a lack of expertise among competent authorities to assess the adequacy and comprehensiveness of EIS's.

In an attempt to fill this void, the following non-mandatory review criteria are proposed:

- Ensure that all relevant information has been analysed and presented;
- assess the validity and accuracy of information contained in the EIS;
- quickly become familiar with the proposed project and consider whether additional information is needed;
- assess the significance of the project's environmental effects;
- evaluate the need for mitigation and monitoring of environmental impacts; and
- advise on whether a project should be allowed to proceed.

Glasson, Therivel and Chadwick (1999) refer to the work of other authors that proposed review criteria in order to fulfil the above listed criteria.

Tomlinson (1989) proposed review criteria in the form of yes/no questions concerning nine main issues: Administration / procedural requirements; effective communication; impact identification; alternatives; information assembly; baseline description; impact prediction; mitigation measures and monitoring / audits.

Lee and Colley (1990) in turn proposed a hierarchical review framework. At the top of the hierarchy is a comprehensive mark (A = well-performed and complete, through to F = very unsatisfactory) for the entire report. This mark is based on marks given to four broad sub-headings: description of the development; local environment and baseline conditions; identification of key impacts and evaluation of key impacts. Glasson, Therivel and Chadwick (1999) describe Lee and Colley's framework as the most commonly-used review framework in the United Kingdom.

Glasson, Therivel and Chadwick (1999) also make mention of recommended review criteria published by the EC that are similar to those of Lee and Colley. Unlike the criteria of Lee and Colley these criteria use eight subheadings instead of four, include a longer list of specific questions, and judge the

information based on relevance to the project context and importance for decision-making as well as presence / absence in the EIS.

Appendix 5.1 provides a checklist of EIS criteria by Glasson, Therivel and Chadwick (1999). Main sections consist of a description of the development, a description of the environment, scoping, consultation and impact identification, prediction and evaluation of impacts, alternatives, mitigation and monitoring, a non-technical summary and the organisation and presentation of information.

The checklist represent an amalgamation and extension of Lee and Colley's and the EC's criteria. It is presented by its authors as a checklist of good practice for both those preparing and those reviewing EISs.

2.5.3.2 Review criteria (Fuller 1999)

In his study Fuller (1999) concentrates on quality and quality control in environmental impact assessment. To him, ultimately, the quality or effectiveness of EIA is tested by whether it "makes a difference". The study is thus concerned with methods ensuring quality in EIA.

Fuller (1999) proceeds to describe various quality control methods in EIA.

One of the most significant quality control methods is the EIA review. However, despite its significance, Fuller (1999) warns that it does have limitations that should be recognized. Since an EIA review is generally reliant on documented information any omissions may lead to a flawed review. Another example is the absence of technological experts on the review team that can cause difficulties where new technology forms part of the development proposal. It is contended that review will not resolve all uncertainties associated with the environmental impact of a proposal, but that at best it will confirm the existence of uncertainties. Differently put, EIA review can ensure that sufficient information is provided as a basis for decision making, but it does not make the decision easier to take.

Another quality control opportunity mentioned by Fuller (1999) is the screening process. The screening process can ensure that EIA is applied appropriately. This not only ensures that projects with potentially significant impacts are assessed, but also that EIA is not inappropriately applied and therefore enhances cost effectiveness.

Fuller (1999) considers the scoping process to be yet another quality control opportunity. According to him quality will only be achieved during this process if practitioners are well briefed, competent with clear objectives.

Impact assessment represents another quality control mechanism mentioned by Fuller (1999). It is strongly suggested that this process should begin as early as possible in the project planning in order to influence the design and location of the proposed project.

To Fuller (1999) perhaps the biggest challenge in instituting effective EIA is that of a link between the EIR and proposed mitigation measures, decision and the implementation of the project. The most recently emerging mechanisms to link documentation to follow-up include an environmental management plan or the establishment of a link to a certified environmental management system.

Fuller (1999) proposes the use of a checklist for the review of environmental assessment process effectiveness (Appendix 5.2). This checklist incorporates all mentioned quality control methods and is also being referred to by the author as criteria for use in an effectiveness study for micro process (EIA system specific) review.

The checklist is broken down into the appropriateness of institutional controls, the adequacy of operational performance for main stages and components of environmental assessment, the relevance of decision-making and the overall results of all effectiveness.

This checklist provides an amalgamation and extension of review criteria found in prominent sources on environmental impact assessment including

Sadler (1987, 1990), Davies and Sadler (1990), Colley and Raymond (1994), Sippe (1994), Hilden and Laitinen (1995) and Wood (1995). Due to its broad consultation the checklist can be considered as being representative of contemporary thinking on environmental assessment system and process review.

2.5.3.3 *General*

The review criteria proposed by Glasson, Therivel and Chadwick (1999) and those provided by Fuller (1999) do not represent two entirely different sets of information and similarities may be encountered in practice. The section dealing with methodology provides an explanation of how these similarities are addressed in the compilation of an appropriate framework for review.

3. METHODOLOGY

3.1 INTRODUCTION

The research is characterised by five stages, each with a distinct approach:

The first stage consists of an assessment of local and international aspects of environmental assessment review and best practices. This stage manifests itself in the relevant literature review, is descriptive in nature and has as its primary purpose the identification of possible review criteria for inclusion in an appropriate review framework.

The second stage relates to the establishment of an appropriate review framework and review criteria based on best practice information already gathered for purposes of a case study review. This stage is analytical in nature with its end product being an appropriate review framework.

The selection of sectoral case studies represents the third stage of this research. This stage is analytical in nature and concerns itself primarily with the identification of selection criteria for sectoral case studies.

During the fourth stage the quality of sectoral case studies (and by implication the environmental impact assessment system and process in South Africa) is measured by applying appropriate measuring instruments to selected case studies. This stage is predominantly analytical in nature.

The identification of key improvement areas forms a fifth stage of this research. Corresponding trends between key improvement areas and issues of concern identified during the literature review are investigated and highlighted. In instances where these similarities occur recommendations found in the literature review are submitted as possible recommendations for key improvement areas. This stage is predominantly analytical and comparative in nature.

3.2 THE ESTABLISHMENT OF AN APPROPRIATE REVIEW FRAMEWORK AND REVIEW CRITERIA

Fuller (1999:61) distinguishes between the following three options for environmental impact assessment (EIA) review methodologies or quality control mechanisms, none of which are mutually exclusive:

- *Ad hoc* review, based entirely upon the expertise of the reviewer;
- review based on the scope of the EIA and linked to a formalised scoping provision; and
- review using review criteria.

The principal method of this research is a review using review criteria. This method receives preference because it provides a systematic basis for review and a consistent framework for comparison.

The first step in compiling a framework for the review of case studies comprised the establishment of a basic framework. In this regard the generic attributes of EIA as well as the resemblance of South African EIA to other international environmental assessment systems served as motivation for the use of the international best practice review criteria of Glasson, Therivel and Chadwick (1999)(Appendix 5.1) and Fuller (1999) (Appendix 5.2) as basis. This measure also ensures the international relevance of the final review framework. Appendix 5.3 provides an indication of which final review criteria were derived from which sources. Apart from a small percentage of shared criteria there are no duplications and review criteria from the respective authors are complementary to each other.

A second step entailed the amalgamation and extension of the basic framework with local review criteria. This was done in order to ensure that the review framework is reflective of the South African Integrated Environmental Assessment process, principles and requirements. Appendix 5.3 provides an indication of which final review criteria were derived from which sources. The local sources that were used for this purpose consisted of the White Paper on Environmental Management Policy, July 1997, the Guideline Document on

EIA Regulations, April 1998 and the Integrated Environmental Management Information Series (2002-2004). Most international review criteria are also found among the local review criteria and it can be said that the final review framework displays an advanced state of amalgamation between international and local review criteria. Over and above areas of amalgamation there are also areas of extension. Extension predominantly manifests itself in the review criteria presented by the White Paper on Environmental Management Policy, July 1997.

A third step was to select a suitable a rating mechanism. In this regard various options exist. As was earlier mentioned Tomlinson (1989) makes use of yes/no answers to rate his responses. Lee and Colley (1990) and Glasson, Therivel and Chadwick (1999) use a general hierarchical rating framework consisting of six different responses for all components of the respective review frameworks. Fuller (1999) makes use of a differentiated hierarchical rating framework in that a different range of possible responses is provided for each component. In the final instance a general hierarchical rating framework similar to those of Lee and Colley (1990) and Glasson, Therivel and Chadwick (1999) was decided upon. This rating mechanism was preferred over the framework used by Tomlinson (1989) because it provides for the allocation of various weights to responses whilst Tomlinson's framework only provides for two possible weights. By allowing various weights or ratings, a more representative reflection of responses and underlying nuances can be distinguished. The general hierarchical rating framework was also preferred over a differentiated hierarchical rating framework in order to provide for a standardised framework that will simplify review.

3.3 SELECTION CRITERIA FOR APPROPRIATE CASE STUDIES

It is the intention of the study to be relevant and to add value to the environmental impact assessment system and process in South Africa. Selected case studies should therefore represent a prominent sector that is characterised by new developments and activities requiring environmental impact assessment and that may have a potentially detrimental impact on the environment.

It is the purpose of the study to assess the quality of the EIA system in South Africa. Selected case studies will therefore have to represent applications for authorisation as is required by the environmental impact assessment system/process in South Africa.

In order to review the system, selected case studies must represent applications that have already been processed by the relevant authority.

The study represents a review of the EIA system and selected case studies should therefore reflect most if not all aspects of the EIA process in South Africa as encapsulated in the system. Selected case studies should thus at the least include an application for authorisation and environmental scoping report.

Information on selected case studies should be accessible.

3.4 QUALITY ASSESSMENT

Quality assessment takes place by:

- Allocating numeric values or scores to respective review criteria;
- comparing ratings allocated to the respective case studies,
- comparing averages allocated to the case studies with averages allocated to the review criteria measuring the appropriateness of institutional controls. This component will form part of Component B of the study.

3.5 THE IDENTIFICATION OF KEY IMPROVEMENT AREAS

Key improvement areas are identified by considering the respective and aggregate values or scores of review criteria and the respective and aggregate values or scores of review categories. Review categories with non-compliance or low compliance ratings are considered to represent key improvement areas. This component will form part of Component B of the study.

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5. APPENDICES

5.1 EIS REVIEW CRITERIA (GLASSON, THERIVEL AND CHADWICK 1999)

EIS number:

Project name:

Reviewer name:

Marking criteria

(A-F) summarise how well EIS fulfils criterion for all criteria

A- good

B- generally satisfactory (minor omissions etc.)

C- just satisfactory (despite omission)

D- just unsatisfactory (because of omission etc.)

E- not satisfactory (significant omission etc)

F- poor

1. DESCRIPTION OF THE DEVELOPMENT

Principal features of the project

- 1.1 Explain the purpose(s) and objective of the development.
- 1.2 Indicates the nature and status of the decision(s) for which the environmental information has been prepared.
- 1.3 Gives the estimated duration of the construction, operational and, where appropriate, decommissioning phase, and the programme within these phases.
- 1.4 Describe the proposed development including its design and size or scale. Diagrams, plans or maps will usually be necessary for this purpose.
- 1.5 Indicate the physical presence or appearance of the completed development within the receiving environment.
- 1.6 Describes the methods of construction.
- 1.7 Describes the nature and methods of production or other types of activity involved in the operation of the project.
- 1.8 Describes any additional services (water, electricity, emergency services etc.) and developments required as a consequence of the project.
- 1.9 Describes the project's potential for accidents, hazards and emergencies.

Land requirements

- 1.10 Defines the land area taken up by the development site and any associated arrangements, auxiliary facilities and landscaping areas and by the construction site(s), and shows their location clearly on a map. For a linear project, describes the land corridor, vertical and horizontal alignment and need for tunnelling and earthworks.
- 1.11 Describes the uses to which this land will be put, and demarcates the different land use areas.

- 1.12 Describes the reinstatement and after-use of landtake during construction.

Project Inputs

- 1.13 Describes the nature and quantities of material needed during the construction and operational phases.
- 1.14 Estimates the number of workers and visitors entering the project site during both construction and operation.
- 1.15 Describes their access to the site and likely means of transport.
- 1.16 Indicates the means of transporting materials and products to and from the site during construction and operation, and the number of movements involved.

Residues and emissions

- 1.17 Estimate the types and quantities of waste matter, energy (noise, vibration, light, heat, radiation etc.) and residual materials generated during construction and operation of the project, and rate at which these will be produced.
- 1.18 Indicates how these waste and residual materials are expected to be handled/treated prior to disposal/release, and the routes by which they will eventually be disposed of to the environment.
- 1.19 Identifies any special or hazardous wastes (defined as...) which will be produced, and describes the methods for their disposal as regards their likely main environmental impacts.
- 1.20 Indicates the methods by which the quantities of residual and waste were estimated. Acknowledges any uncertainty, and gives ranges or confidence limits where appropriate.

2. DESCRIPTION OF THE ENVIRONMENT

Description of the area occupied by and surrounding the project

- 2.1 Indicates the area expected to be significantly affected by the various aspects of the project with the aid of suitable maps. Explain the time over which these impacts are likely to occur.
- 2.2 Describes the land uses on the site(s) and in surrounding areas.
- 2.3 Defines the affected environment broadly enough to include any potentially significant effects occurring away from the immediate areas of construction and operation. These may be caused by, for example, the dispersion of pollutants, infrastructural requirements of the project, traffic etc.

Baseline conditions

- 2.4 Identifies and describes the components of the affected environment potentially affected by the project.
- 2.5 The methods used to investigate the affected environment are appropriate to the size and complexity of the assessment task. Uncertainty is indicated.

- 2.6 Predicts the likely future environmental conditions in the absence of the project. Identifies variability in natural system and human use.
- 2.7 Uses existing technical data sources, including records and studies carried out for environmental agencies and for special interest group.
- 2.8 Reviews local regional national plans and policies, and other data collected as necessary to predict future environmental condition. Where the proposal does not conform to these plans and policies, the departure is justified.
- 2.9 Local, regional and national agencies holding information on baseline environmental condition have been approached.

3. SCOPING, CONSULTATION, AND IMPACT IDENTIFICATION

Scoping and consultation

- 3.1 There has been a genuine attempt to contact the general public, relevant public agencies, relevant experts and special interest groups to appraise them of the project and its implication. List the groups approached.
- 3.2 Statutory consultees have been contacted. List the consultees approached.
- 3.3 Identifies valued environmental attributes on the basis of this consultation.
- 3.4 Identifies all project activities with the significant impacts on valued environmental attributes. Identifies and selects key impacts for more intense investigation. Describes and justifies the scoping methods used.
- 3.5 Include a copy or summary of the main comments from consultees and the public, and measures taken to respond to these comments.

Impact identification

- 3.6 Consider direct and indirect/secondary effects of construction, operating and, where relevant, after-use or decommissioning of the project (including positive and negative effects). Consider whether effects will arise as a result of "consequential" development.
- 3.7 Investigates the above types of impacts in so far as they affect: human beings, fauna, flora, water, soil, climate, landscape, interaction between the above, material assets, cultural heritage.
- 3.8 Also noise, land use, historic heritage, communities.
- 3.9 If any of the above are not of concern in relation to the specific project and its location, this is clearly stated.
- 3.10 Identifies inputs using a systematic methodology such as project specific checklist, matrices, panels of experts, extensive consultation, etc. Describes the methods/approaches used and the rationale for using them.
- 3.11 The investigation of each type of impact is appropriate to its importance for the decision, avoiding unnecessary information and concentrating on the key issues.
- 3.12 Consider impacts which may not themselves be significant but which may contribute incrementally to a significant effect.

- 3.13 Consider impacts which might arise from non standard operating conditions, accidents and emergencies.
- 3.14 If the nature of the project is such that accidents are possible which might cause severe damage within the surrounding environment, an assessment of the probability and likely consequences of such events is carried out and the main findings reported.

4. PREDICTION AND EVALUATION OF IMPACTS

Prediction of magnitude of impacts

- 4.1 Describes impacts in terms of the nature and magnitude of the change occurring and the nature, location , number, value, sensitivity of the affected receptors.
- 4.2 Predict the timescale over which the effects will occur, so that it is clear whether Impacts are short, medium or long term, temporary or permanent, reversible or irreversible.
- 4.3 Where possible, expresses impact prediction in quantitative terms. Qualitative description, where necessary, are as fully defined as possible.
- 4.4 Describes the likelihood of the impacts occurring, and the level of uncertainty attached to the results.

Methods and data

- 4.5 The Methods used to predict the nature, size, scale of impacts are described, and are appropriate to the size and importance of the projected disturbance.
- 4.6 The data used to estimate the size and the scale of the main impacts are sufficient for the task, clearly described, and their sources clearly identified. Any gaps in the data are indicated and accounted for.

Evaluation of impact significance

- 4.7 Discusses the significance of effects in terms of the impact on the local community (including distribution of impacts) and on the protection of environmental resources.
- 4.8 Discusses the available standard, assumption and value system which can be used to assess significance.
- 4.9 Where there are no generally accepted standard or criteria for the evaluation of significance, alternative approaches are discussed and if so, a clear distinction is made between fact, assumption and professional judgment.
- 4.10 Discusses the significance of the effects taking into account the appropriate national and international standards of norms, where these are available. Otherwise the magnitude, location and duration of the effects are discussed in conjunction with the value, sensitivity and rarity of the resources.
- 4.11 Differentiates project-generated impacts from other changes resulting from non-project activities and variables.
- 4.12 Includes a clear indication of which impacts may be significant and which may not.

5. ALTERNATIVES

- 5.1 Considers the “non action” alternative, alternative processes, scales, layouts, designs operation condition where available at an early stage of project planning, and investigates their main environmental advantages and disadvantages .
- 5.2 If unexpectedly sever adverse impacts are identified during the course of the investigation, which are difficult to mitigate, alternatives rejected in the earlier planning phase are re-appraised.
- 5.3 Gives the reason for selecting the proposed project, and the part environmental factors played in the selection.
- 5.4 The alternatives are realistic and genuine.
- 5.5 Compares the alternatives' main environmental impacts clearly and objectively with those of the propose project and within the likely future environmental without the project.

6. MITIGATION AND MONITORING

Description of mitigation measure

- 6.1 Considers the mitigation of all significant negative impacts and, where feasible, proposes specific mitigation measures to address each impact.
- 6.2 Mitigation measures considered include modification of project design, construction and operation, the replacement of facilities/resources, and the creation of new resources as well as ‘end-of pipe’ technologies for pollution control.
- 6.3 Describes the reason for choosing the particular type of mitigation, and other option available.
- 6.4 Explain the extent to which the mitigation methods will be effective. Where the effectiveness is uncertain, or where mitigation may not work, this is made clear and data are introduced to justify the acceptance of these assumptions.
- 6.5 Indicates the significance of any residual or unmitigated impacts remaining after mitigation, and justifies why these impacts should not be mitigated.

Commitment to mitigation and monitoring

- 6.6 Gives details of how mitigation measures will be implemented and function over the time span for which they are necessary.
- 6.7 Proposes monitoring arrangements for all significant impacts, especially where uncertainty exists, to check the environmental impact resulting from the implementation of the project and their conformity with the prediction made.
- 6.8 The scale of any proposed monitoring arrangements corresponds to the potential scale and significance of deviation from expected impacts.

Environmental effects of mitigation

- 6.9 Investigates and describes any adverse environmental effects of mitigation measures.
- 6.10 Considers the potential for conflict between the benefit of mitigation measures and their adverse impacts.

7. NON-TECHNICAL SUMMARY

Non-technical summary

- 7.1 There is a non technical summary of the main findings of the study, which contains at least a brief description of the project and the environment, an account of the main mitigation measures to be undertaken by the developer, and a description of any remaining or residual impacts.
- 7.2 The summary avoids technical terms, list of data and detailed explanation of scientific reasoning.
- 7.3 The summary present the main findings of the assessment and covers all the main issues raised in the information.
- 7.4 The summary includes a brief explanation of the overall approach to the assessment.
- 7.5 The summary indicates the confidence which can be placed in the result.

8. ORGANISATION AND PRESENTATION OF INFORMATION

Organisation of the information

- 8.1 Logically arranges the information in section.
- 8.2 Identifies the location of information in a table or list contents.
- 8.3 There are chapter or section summaries outlining the main findings of each phase of the investigation.
- 8.4 When information from external sources has been introduced, a full reference to the sources is included.

Presentation of information

- 8.5 Mention the relevant EIA legislation, name of the developer, name of competent authority(ies), name of organization preparing the EIS, and name, address and contact number of contact person.
- 8.6 Include an introduction briefly describing the project, the aims of the assessment, and the method used.
- 8.7 The statement is presented as an integrated whole. Data presented in appendices are fully discussed in the main body of the text.
- 8.8 Offers information and analysis to support all conclusion drawn.
- 8.9 Present information so as to be comprehensible to the non specialist. Uses maps, tables, graphical material and other devices as appropriate. Avoids unnecessarily technical or obscure language.
- 8.10 Discusses all the important data and results in an integrated fashion.
- 8.11 Avoids superfluous information (i.e information not needed for the decision).

- 8.12 Present the information in a concise form with a consistent terminology and logical links between different sections.
- 8.13 Gives prominence and emphasis to severe adverse impacts, substantial environmental benefits, and controversial issues.
- 8.14 Defines technical terms, acronyms and initials.
- 8.15 The information is objective, and does not lobby for any particular point of view. Adverse impacts are not disguised by euphemisms or platitudes.

Difficulties compiling the information

- 8.16 Indicates any gaps in the required data and explains the means used to deal with them in the assessment.
- 8.17 Acknowledges and explains any difficulties in assembling or analyzing the data needed to predict impacts, and any basis for questioning assumption, data or information.

5.2 CHECKLIST FOR REVIEW OF ENVIRONMENTAL ASSESSMENT PROCESS EFFECTIVENESS (FULLER 1999)

The checklist is broken down into four parts. Each one can be completed as a separate exercise or as part of a comprehensive process-wide or proposal-specific review. Some adaptation to circumstances will be needed. Not all questions may be relevant, and for in depth review supplementary ones will certainly need to be added. Finally, there are two levels of detail at which the evaluation may be undertaken:

- 1 Marking whether the item is present or not with comments as required.
- 2 Grading the level of appropriateness of component or performance of our activity as per the rating scale used in each sector.

Step 1 Appropriateness of institutional controls

The following rating scale may be used to answer the following question in detail:

- A Excellent (comprehensive and sufficient).
- B Good (minor gaps and inadequacies).
- C Satisfactory (some gaps inadequacies)
- D Poor (significant gaps and inadequacies)
- E Very poor (fundamental flaws and weaknesses).
- F No option (insufficient basis/experience on which to judge).

Is the EA process based on, or did it include:

- (a) Clear legal provision?
- (b) Explicit requirements to cover all environmentally?
- (c) Significant proposal?
- (d) Broad definition of environmental/coverage of factors?
- (e) Opportunities for public involvement:
 - (i) At specified stages only?
 - (ii) Throughout the process?
- (f) Procedure for independent, expert review for EAs:
 - (i) By interagency committee?
 - (ii) By spending commission or equivalent body?
 - (iii) By hock panel, board or tribunal
- (g) Guidance on application of procedure including:
 - (i) Proposal-specific terms of reference?
 - (ii) Agreed timelines for completion?
- (h) Visible linkage to decision-making (e.g. approval, permitting, etc, based on submission of report):
 - (i) Specification of terms and condition for implementation?
 - (ii) With provision of follow-up (e.g. monitoring)
That are legally enforceable?

Step 2 Adequacy of operational performance for main stages and components of environmental assessment

The following rating scale may be used to answer the question in detail:

- A** Excellent (thoroughly and competently performed).
- B** Good (minor omission and deficiencies).
- C** Satisfactory (some omission and deficiencies).
- D** Poor (significant omission and deficiencies).
- E** Very poor (fundamental flaws and weaknesses).
- F** No opinion (insufficient basis/experience on which to judge).

Main stages: were the following activities completed fully and successfully:

- (a) Screening-proposal classified correctly as to level and requirement for assessment?
- (b) Scoping-process completed and resulted in initial closure ? i.e.:
 - (i) Priority issues and relevant impacts identified?
 - (ii) Key factors involved?
 - (iii) Reasonable alternatives established?
 - (iv) Terms of reference/study guidelines prepared?
- (c) Impact analysis-process completed in scope and depth necessary?, including:
 - (i) Affected environment (baseline) condition described?
 - (ii) Estimation and prediction of main impact categories?, including: indirect and cumulative effects, other relevant factors?
 - (iii) Suitable data base and methodologies used?
- (d) Mitigation –necessary measure or environmental management plan identified?, including:
 - (i) Follow-up monitoring arrangements if strategies are untried or impacts uncertain?
 - (ii) Specification of contingency plan or non-standardized operating responses?
- (e) Significance-residual effects evaluated as to potential severity, including reference to:
 - (i) Their scope, duration and irreversibility?
 - (ii) Relative importance to dependent communities or ecological function?
 - (iii) Possible compensation or offset mechanisms (also 2d above)?
- (f) EIS/EA report-information included is consistent with the process followed, and is:
 - (i) Complete - informed decision can be made?
 - (ii) Suitable - right type of information included
 - (iii) Understandable-easily apprehended by decision maker?
 - (iv) Reliable - meets established professional and disciplinary standards?
 - (v) Defensible – risk and impact are qualified as to proposal uncertainties?
 - (vi) Actionable – provides clear basis for choice and condition setting?
- (g) Review of quality-undertaken to the level necessary, including:
 - (i) Use of suitable methodology?
 - (ii) Subject to public review and expert comment?

- (ii) As supported by the adequacy of: Technical studies (see 2h)?
Public involvement (see 2i)? Process administration (see 2j)
- (c) Influence on the decision-making, specifically the conclusions/advice and recommendation in the EIS/EA report:
 - (i) Fully or substantially followed?
 - (ii) Partially or moderately followed?
 - (iii) Ignored or marginally followed?
- (d) If the EIS/EA report was partially or marginally influential on approval and condition setting, what were the reasons? E.g:
 - (i) As described by the analysis of input to decision making?
 - (ii) Due to intrusion of other factors and circumstances? Please specify (Note: what is the evidence for the interpretation?).
Comparison of EIS report content with: Record of decision?
Interviews with participants? Other?
- (e) Identification of follow up requirements? Including:
 - (i) Supervision or surveillance of compliance?
 - (ii) Impact monitoring
 - (iii) Environmental assessment plan?
 - (iv) Environmental or impact audit?
 - (v) Post-project analysis or other research or studies?
- (f) Terms and condition implemented?
 - (i) Fully?
 - (ii) Partly?
 - (iii) Inadequately or not at all?
- (g) If terms and condition were not fully implemented, what were the reason?, e.g:
 - (i) Unforeseen impacts and/or ineffectiveness or mitigation measures necessitated changes?
 - (ii) Other events and circumstances intervened?

Step 4 Overall results of all effectiveness

Based on the evidence from monitoring, auditing and other sources, what was the overall result of the EA process?

- (a) Impacts were predicted or forecast:
 - (i) In most cases (>66%) with minor inaccuracies?
 - (ii) In fewer cases (<33%) with major inaccuracies?
- (b) Mitigation measure or management plans worked as intended:
 - (i) In most cases (>66%) with no minor problem?
 - (ii) In fewer cases (<33%) with major problems?
- (c) Environmental objectives, criteria or standards met by project/plan as implemented:
 - (i) As confirmed by compliance or effects monitoring
 - (ii) As evidenced by other sources of information?
- (d) Impacts were avoided, mitigated or reasonably compensated:
 - (i) In most cases (>66%) with no unacceptable loss or damage?
 - (ii) In fewer cases (<33%) with unacceptable loss or damage?
- (e) Other environmental and community benefits were realized as described?
 - (i) In most cases (>66%) with other minor difficulties encountered?
 - (ii) In fewer cases (<33%) with major difficulties examined?

- (f) The EA process was within the usual 1% cost range in relation to the overall capital investment in proposal development:
 - (i) Yes?
 - (ii) No (specify why)?
- (g) On balance, the EA process was effective judged against the basic yardsticks:
 - (i) Substantive-terms reference and basic objectives were achieved: As documented by inputs to decision-making? As demonstrated by environmental and community benefits (impact avoidance)?
 - (ii) Procedural- the process conformed to established or accepted principle, provisions and procedures? i.e As shown by appropriate institutional controls? As evidenced by successful completion of main stages and components?
 - (iii) Transactive-result and environmental gains were achieved cost-effectively? E.g. At least cost as shown by appropriate methodology? At reasonable cost as estimated by informed judgement?

5.3 A FRAMEWORK FOR REVIEW

Rating scale:

- 1: Non-compliance
- 2: Low compliance
- 3: Moderate compliance
- 4: High compliance
- 5: Full compliance

REVIEW CRITERIA		SOURCES				
		Glasson <i>et. al</i> (1999)	Fuller (1999)	DEAT (2002a-e) (2004a-h)	DEAT (1998)	WPEMP
1	<u>DESCRIPTION OF THE DEVELOPMENT</u>					
1.1	Principle project features					
A	Explanation of purpose & objectives of the development	x		x	x	
B	Indication of the nature and status of the decision required	x		x	x	
C	Indication of estimated duration of construction, operational and decommissioning phases	x		x	x	
D	Description of development including design and scale (inclusion of diagrams & maps)	x		x	x	
E	Indication of physical presence/appearance of completed development within receiving environment	x		x	x	
F	Description of methods of construction	x		x	x	
G	Description of nature and methods of production or other activities involved in operation of project	x		x	x	
H	Description of additional services and developments required as a consequence of the project	x		x	x	
I	Description of potential for accidents, hazards and emergencies	x		x		
J	Inclusion of schematic drawings and discussions of the project's production processes and technology	x		x	x	
1.2	Land requirements					
A	Description of affected area, associated arrangements, auxiliary facilities etc (including maps)	x		x	x	
B	Description and demarcation of envisaged land uses	x		x	x	
C	Description of the re-instatement and after-use of landtake	x				
1.3	Project inputs					
A	Description of nature & quantities of materials needed during the construction & operational phases	x		x		
B	Estimate of number of workers and visitors entering site both during construction & operation	x		x	x	

C	Description of their access to the site and likely means of transport	x		x		
D	Indication of methods to transport materials & products to and from site (construction & operation)	x		x		
1.4	Residues & emissions					
A	Estimated types & quantities of waste, energy & residual matter generated during construction & operation	x		x	x	
B	Indication of how these materials will be disposed of	x		x	x	
C	Identification of special or hazardous wastes to be produced and methods of disposal	x		x		
D	Indication of methods of waste estimation and acknowledgement of uncertainties and confidence levels	x		x	x	x
2	DESCRIPTION OF THE ENVIRONMENT					
2.1	Description of area occupied and surrounded by development					
A	Indication of affected area including maps	x		x	x	
B	Description of land uses on site and in surrounding areas	x		x	x	
C	Definition of affected environment in broadest possible sense	x	x	x	x	
2.2	Baseline conditions					
A	Identification & description of components of environment potentially affected by the development	x	x	x	x	
B	Biophysical, biological and social description of site			x	x	
C	Description of methods used to investigate appropriateness of project (size & complexity of assessment)	x		x	x	
D	Prediction of the likely future environmental conditions in the absence of the project	x		x		
E	Use of existing technical data sources, including records and studies carried out	x		x		
F	Review of local, regional and national plans & policies. Justification of departure where applicable.	x		x	x	
G	Indication of involvement of local, regional and national agencies holding baseline information	x		x	x	
3	SCREENING, SCOPING, CONSULTATION AND IMPACT IDENTIFICATION					
3.1	Screening					
A	Correctness of classification of proposal as to level and requirement for assessment		x	x	x	x
B	Evidence of other pre-submission decisions to provide environmental offsets		x	x		
C	Pro-environmental pre-application modifications (eg. alteration of initial concept, alternatives etc.)		x	x		
3.2	Scoping and consultation					
A	Preparation of terms of reference / study guidelines		x	x	x	x
B	Proof of public participation including newspaper advertisement, on-site notice and correspondence			x	x	x
C	Consideration of likely extent of social dislocation		x	x		x
D	Consideration of degree of public concern/conflict that was evident		x	x	x	x
E	Consideration of potential and actual conflict of interest			x	x	x
F	Consideration of the traditions of the affected people		x	x		x
G	Relevance of approaches & techniques applied to issues and constituencies involved		x	x		x
H	Availability of information on where reports can be obtained and examined			x	x	x

I	Involvement of key actors during all stages of process			x	x	x
J	Proof of governmental role player involvement and co-ordination			x	x	x
K	Reference to role of environmental justice			x		x
L	Identification of valued environmental attributes based on consultation & incorporation into documentation		x	x	x	
M	Evidence of recognition of all forms of knowledge		x	x		x
N	Selection of issues & key impacts for investigation, description & justification of scoping methods used		x	x	x	
O	Inclusion of copy or summary of main comments from role players & public, and responding measures			x	x	
P	Completion of process that resulted in initial closure (positive record of decision)		x			
3.3	Impact identification					
A	Consideration of direct/indirect effect of development phases, also "consequential developments"	x	x	x	x	x
B	Investigation of these impacts to flora, fauna, soil, water, air, climate, landscape, material assets etc.	x		x	x	x
C	Investigation of noise, land use, historic heritage and communities (state clearly if not of concern)	x		x	x	x
D	Identification of impacts using a systematic methodology such as matrices, checklists etc. (describe)	x		x	x	
E	Appropriateness of impact investigation to importance for decision & key issues	x		x		
F	Consideration of incrementally significant impacts	x		x		
G	Consideration of impacts that may arise from non-standard operating conditions, accidents & emergencies	x		x		x
H	Assessment of probable and likely consequences of accidents that may cause severe damage	x		x		
4	PREDICTION AND EVALUATION OF IMPACTS					
4.1	Prediction of magnitude of impacts					
A	Description of impacts (nature & magnitude of change occurring & detail of affected receptors)	x		x	x	
B	Prediction of the time scale of impacts – short, medium or long term, permanency and reversibility	x		x	x	
C	Expression of impact predictions in quantitative terms as well as qualitative expressions where applicable	x		x	x	
D	Description of the likelihood of impacts occurring and level of uncertainty attached to results	x		x	x	x
4.2	Methods & data					
A	Methodology to predict nature, size & scale of impacts & importance (size & projected disturbance)	x		x	x	
B	Description of data used to estimate size & scale of impacts and identification of sources and data gaps	x		x		
C	Utilisation of suitable databases and methodologies		x	x	x	
4.3	Evaluation of impact significance					
A	Discussion of impact significance on local community and the protection of environmental resources	x		x	x	
B	Description of ecological context			x	x	
C	Description of international, national and provincial importance of proposed development			x	x	
D	Discussion of available standards, assumptions and value systems for assessment of significance	x		x	x	
E	Discussion of alternative approaches with distinction between fact, assumption & professional judgement	x		x	x	
F	Description of method of assessing the significance of impacts			x	x	

G	Discussion of significance its magnitude, location, duration, value, sensitivity and rarity of resources	x		x	x	
H	Estimation and prediction of indirect and cumulative impacts	x		x		
I	Evaluation of residual effects its potential severity including scope, duration & irreversibility		x	x	x	
J	Discussion of / reference to the alienation of resources			x		x
K	Differentiation of project generated impacts from other changes resulting from non-project activities		x			
L	Inclusion of a clear indication of which impacts may be significant and which may not be significant			x		
M	Consideration of link and interaction between environmental elements			x	x	x
N	Completion of process in necessary scope and depth		x	x	x	
O	Evidence of full cost accounting			x		x
P	Consistency of information included with the process followed		x			
4.4	Alternatives					
A	Consideration of "no-action", process, layout, scale and operating alternatives (including "pros and cons")	x		x	x	
B	Description of reasonable & feasible alternatives identified during scoping that may be further investigated			x	x	
C	Re-appraisal of alternatives identified if unexpectedly severe adverse impacts are identified	x			x	
D	Reasons for selecting the proposed project and the part environmental factors played in the selection	x		x	x	
E	Credibility and realism of alternatives	x		x	x	
F	Clear & objective comparison of alternatives' main environmental impacts with those of project	x				
5	MITIGATION & MONITORING					
5.1	Description of mitigation measures					
A	Consideration of mitigation of all significant negative impacts including specific measures for each impact	x		x	x	
B	Inclusion of mitigating measures for modification of project design, construction, pollution control etc.	x		x	x	x
C	Description of reasons for choosing a particular type of mitigation and other options available	x		x	x	
D	Explanation of the extent to which mitigation methods will be effective (indicate uncertainty if applicable)	x			x	
E	Indication of significance of residual or unmitigated impacts, and justification why it should not be mitigated	x		x	x	
5.2	Commitment to mitigation and monitoring					
A	Provision for clear base and condition setting			x		
B	Environmental management plan including follow-up and monitoring arrangements		x	x		
C	Detailed description of how mitigation measures will be implemented and function over required time span	x		x		
D	Proposal for impact monitoring, especially in the case of uncertainty	x	x	x	x	
E	Correspondence between proposed monitoring arrangements and potential scale impact deviations	x				
F	Possibility of compensation or offset mechanisms including capacity building, skills transfer and education		x	x		
G	Evidence of "polluter pays" principles					x
5.3	Environmental effects of mitigation					
A	Investigation & description of any adverse environmental effects of mitigation measures	x				

B	Consideration of the potential for conflict between the benefits of mitigation measures & its adverse impact	x				
6	NON-TECHNICAL SUMMARY					
A	Existence of non-technical summary of main findings (project description, mitigation, residual impacts etc.)	x		x	x	
B	Avoidance of technical terms, list of data & detailed explanations of scientific reasoning in summary	x		x	x	
C	Inclusion of main findings and issues of assessment in summary	x		x		
D	Inclusion in summary of brief explanation of overall approach to the assessment	x		x		
E	Indication in summary of the confidence which can be placed on the results	x		x		
7	ORGANISATION & INTERPRETATION OF INFORMATION					
7.1	Organisation of the information					
A	Logical arrangement of information in sections	x		x	x	
B	Identification of the location of information in a table or list of contents	x		x	x	
C	Inclusion of chapter or section summaries outlining main findings of each phase of investigation	x		x		
D	Inclusion of a full reference where external sources have been introduced	x		x		
7.2	Presentation of information					
A	Referral to relevant legislation and particulars of applicant and independent consultant	x		x	x	
B	Inclusion of an introduction briefly describing the project, the aims of the assessment and methods used	x		x	x	
C	Presentation of EIR as an integrated whole with full discussion in text of appendices	x	x	x	x	
D	Existence of information and analysis to support all conclusions drawn	x	x	x	x	
E	Presentation of information in a comprehensible non-technical manner with use of maps, tables etc.	x	x	x	x	
F	Discussion of all important data and results in an integrated fashion	x		x	x	
G	Avoidance of superfluous information (information not necessary for decision)	x		x	x	
H	Presentation of information in a concise form with consistent terminology & logical links between sections	x		x	x	
I	Allocation of prominence and emphasis to severe adverse impacts, benefits and controversial issues	x		x	x	
J	Reliability of information included to established professional & disciplinary standards		x	x		
K	Rigorous application of technical studies consistent with nature & complexity of issues		x	x		
L	Conformation of work to prevailing standards of good science and EIA practice		x	x	x	
M	Definition of technical terms, acronyms and initials	x		x		
N	Objectivity of information (ensure that adverse impacts are not disguised by euphemisms and platitudes)	x		x	x	
O	Defensibility of information to the risk and impact qualification as opposed to proposal uncertainties		x	x	x	
P	Underlying presence of "cradle to grave" principle			x		x
Q	Availability to public review and expert comment		x	x	x	x
7.3	Difficulties compiling the information					
A	Indication of gaps in the required data and explanation of means to deal with it	x		x		
B	Acknowledgement of difficulties in assembling or analysing the data needed to predict impacts	x		x		

8	<i>APPROPRIATENESS OF INSTITUTIONAL CONTROLS</i>				
A	Inclusion of clear legal provisions in EIA provisions including allocation of functions		x	x	x
B	Inclusion of an explicit requirement to cover all environmentally		x	x	x
C	Clarity on respective roles and responsibilities of all role players			x	x
D	Inclusion of significant proposals		x	x	x
E	Inclusion of broad definition of environmental / coverage factors		x	x	x
F	Opportunities for public involvement throughout the process		x	x	x
G	Existence of procedures for independent, expert review of EIR's		x	x	x
H	Guidance on application of procedures, including proposal specific terms of reference		x	x	x
I	Agreed timelines for completion		x	x	x
J	Visible linkage to decision-making (e.g. approval, permitting etc. based on submission of report)		x	x	x
K	Specification of terms and conditions of implementation		x	x	
L	Provisions for follow-up / monitoring		x	x	x
M	Enforceability of provisions		x		x

COMPONENT B

JOURNAL-FORMAT PAPER

LINDE, C.; FINCHAM, R. & QUINN, N. The environmental impact assessment system in South Africa: A critical review based on case studies and a literature review.

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1. INTRODUCTION

Regulatory environmental impact assessment (EIA) with integral project review mechanisms has been operational in South Africa for more than seven years. In addition, the earliest voluntary environmental assessments in South Africa date as far back as 1971 (Mafune, Mclean, Rodkin and Hill 1997).

More recent literature on the subject suggests that the South African EIA process may still be open to improvement. Aspects that are mentioned include stakeholder involvement (McDaid 2000), institutional capacity (De Wit 2001) and impact monitoring and review (Cubitt and Diab 2001).

The White Paper on Environmental Management Policy, dated July 1997, reiterates the importance of review by stating the development of "... transparent review processes for all aspects of environmental management" as one of its supporting objectives (DEAT 1997:33).

Most review studies on environmental impact assessment in South Africa only concentrate on specific aspects of the process. If considered on its own, these studies present little more than fragmented and single faceted reflections on a multi-faceted process. In certain reviews (see Mafune *et al.* (1997) and Wood (1999)) a more holistic approach has been adopted. However, certain considerations detract from the holistic and contemporary value of these studies. Although the use of case studies in Mafune *et al.* (1997) provide a useful link between policy, theory and practice, the five review criteria cannot be considered to represent a comprehensive reflection of the environmental impact assessment process in South Africa. Whilst the review criteria used in Wood (1999) provides a more comprehensive reflection of the core components of EIA in South Africa and EIA practices elsewhere, a link between policy, theory and practice through the use of case studies or any other method is not provided. In the case of both studies a considerable lapse of time further detracts from its significance.

In view of the above EIA review in South Africa can be said to consist of a number of review studies that only focus and make recommendations on specific aspects of the process, as well as a much smaller and dated number of holistically inclined EIA reviews linking policy / theory to practice.

It is believed that a critical review of the South African environmental impact assessment system informed by standing policy and preferred review frameworks that are applied to actual case studies provides a much needed holistic update on similar reviews such as that of Mafune *et al.* (1997) and Wood (1999). The review does not only fill an existing gap in literature on the subject but it also provides an indication of the extent to which practice conforms to policy in EIA. Finally it is hoped that the incorporation of findings and recommendations made in this review into procedure may positively contribute to the system and by implication the process of EIA in South Africa.

2. MATERIALS AND METHODS

Fuller (1999:61) distinguishes between the following three options for environmental impact assessment (EIA) review methodologies or quality control mechanisms, none of which are mutually exclusive:

- *Ad hoc* review, based entirely upon the expertise of the reviewer;
- Review based on the scope of the EIA and linked to a formalised scoping provision; and
- review using review criteria.

The principle method of research is a review using review criteria. This method receives preference because it provides a systematic basis for review and a consistent framework for comparison.

Certain steps were followed in the compilation of a review framework. In order to ensure the international relevance of the review, a basic review framework was compiled by integrating the international best practice review criteria of Glasson, Therivel and Chadwick (1999) and Fuller (1999). In order to ensure that the review framework is reflective of the South African EIA process, principles and requirements, the basic framework was amalgamated and extended with review criteria contained in the White Paper on Environmental Management Policy (DEAT 1997), the Guideline Document on EIA Regulations (DEAT 1998) and the Integrated Environmental Management Information Series (2002-2004). The following review categories were identified during this process:

- Description of the environment ;
- screening, scoping, consultation and impact identification
- prediction and evaluation of impacts;
- mitigation and monitoring;
- non-technical summary;
- organisation and interpretation of information;
- appropriateness of institutional controls.

Next, a general hierarchical rating framework providing for five different responses (non-compliance, low compliance, moderate compliance, high compliance and full compliance) was selected. The standardised nature of this framework simplifies review. By allowing for various weights or ratings, a more representative reflection of responses and underlying nuances can be detected. Appendix 1 represents the final review and rating framework.

Once the review framework was established, the selection of sectoral case studies took place against specific criteria. Suitable case studies had to be registered on the EIA system, reflective of most if not all aspects of EIA, assessed in terms of the scoping process, representative of a prominent and developing sector and easily accessible. The following two case studies were selected for purposes of this research:

- The proposed establishment of a medical waste incinerator at Benoni South;
- The proposed establishment of a medical waste incinerator at Germiston.

Both studies represent applications that were assessed in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989). They also originate from the medical incineration sector. These similarities are viewed positively for purposes of comparison. Information on these case studies are also easily accessible since they already received Records of Decision and the documentation therefore becomes public information in terms of Section 12 of Government Notice R. 1183 of Government Gazette No. 18261, 5 September 1997 as amended. Both Records of Decision were negative and required a full scale Environmental Impact Assessment.

The quality of sectoral case studies (and by implication the environmental impact assessment system and process in South Africa) is assessed and results discussed in the next section on results. This stage is predominantly analytical in nature. Quality assessment takes place by:

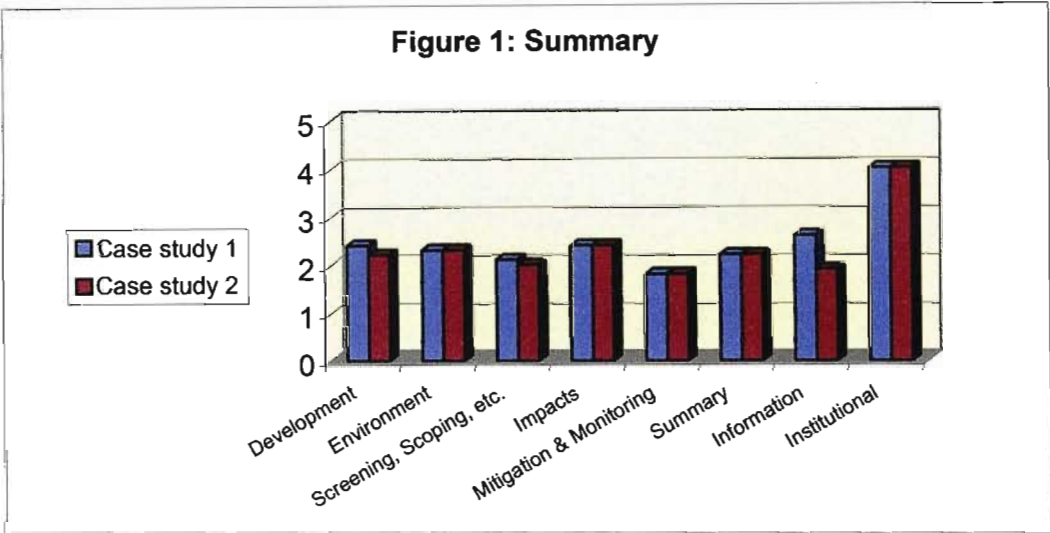
- Allocating numeric values or scores to respective review criteria;
- comparing ratings allocated to the respective case studies.

Lastly the identification of key improvement areas takes place based on review results in that review categories with non-compliance or low compliance ratings are considered to represent key improvement areas. Corresponding trends between key improvement areas and issues of concern identified during the literature review are investigated and highlighted. In instances where these similarities occur recommendations found in the literature review are submitted as possible recommendations for key improvement areas. This stage is predominantly analytical and comparative in nature.

3. RESULTS

Appendix 1 contains the compliance ratings allocated to case studies in terms of the relevant review criteria and review categories. Appendix 2 contains motivations for criteria ratings.

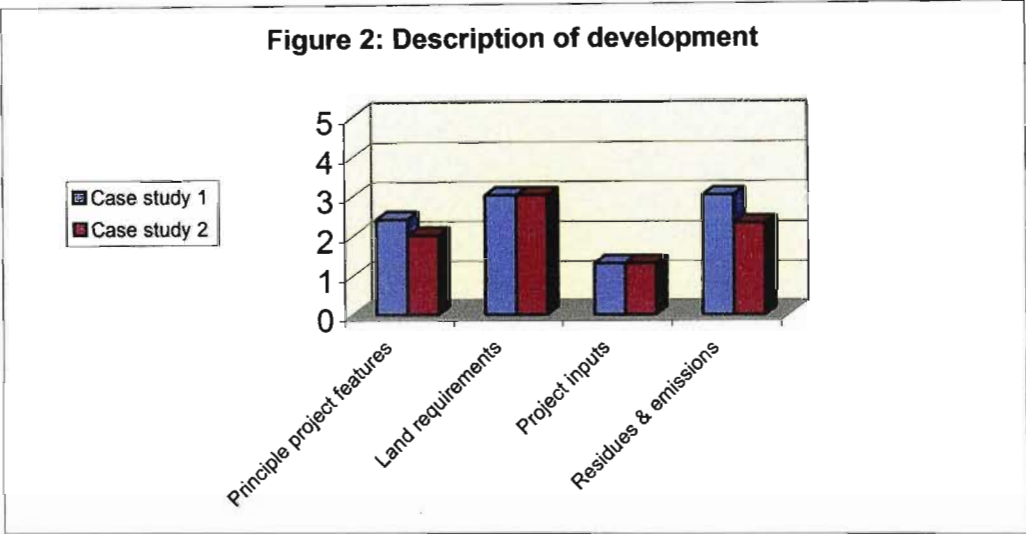
Figure 1 represents a graphic overview of the ratings allocated to the respective review categories as per respective case studies.



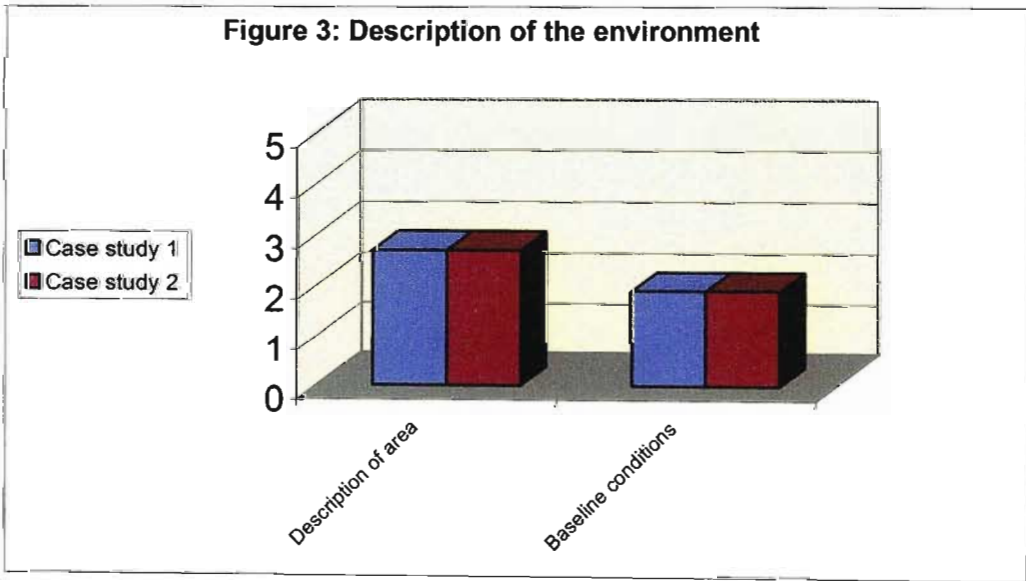
All review categories, with the exception of the category dealing with institutional controls, were allocated ratings suggesting low compliance and key improvement areas. The category dealing with mitigation and monitoring was allocated the lowest rating. The category dealing with institutional controls was allocated the highest rating suggesting high compliance. Both case studies were allocated similar ratings with regard to all review categories.

These overall ratings can be further broken down for each review category in terms of ratings for sub-categories. This exercise may prove useful for

determining sharp fluctuations between sub-categories and between case studies.

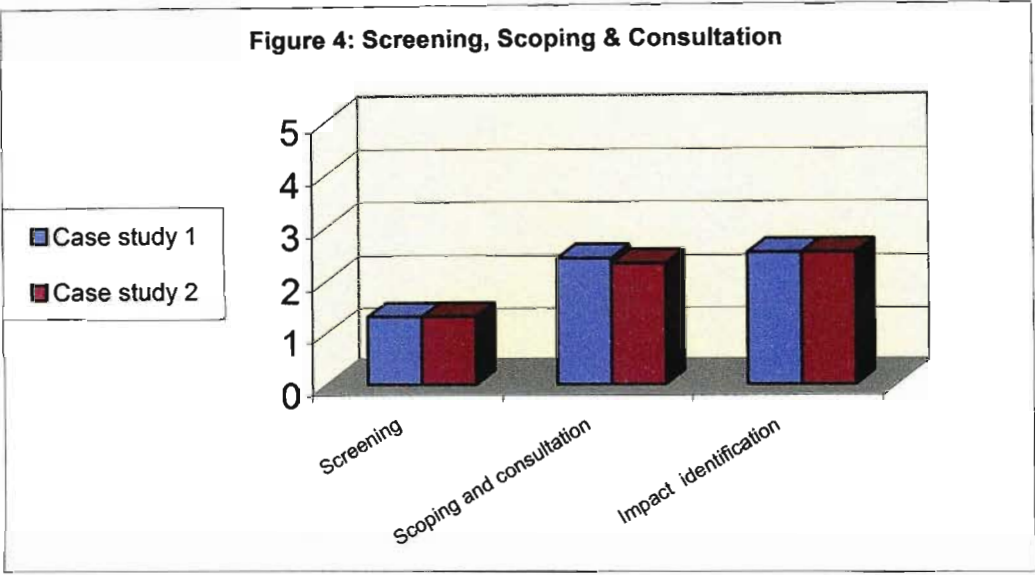


Although the ratings for the description of the development reflect a measure of fluctuation between the various sub-categories, none of the case studies are allocated more than moderate compliance as per the respective sub-categories. The respective case studies were allocated similar ratings.

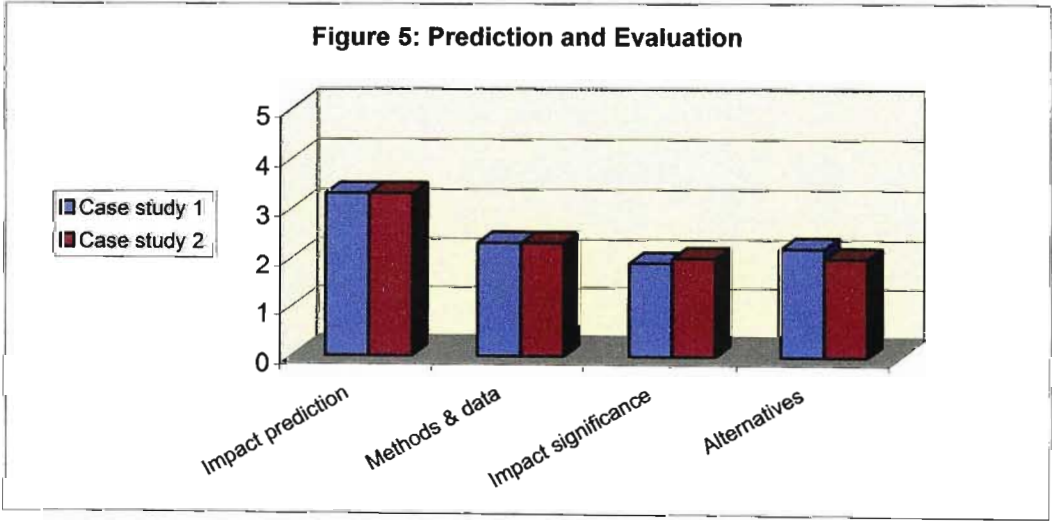


Although the ratings for the description of the environment reflect a measure of fluctuation between the sub-categories, none of the case studies are

allocated more than moderate compliance. The respective case studies were allocated similar ratings.

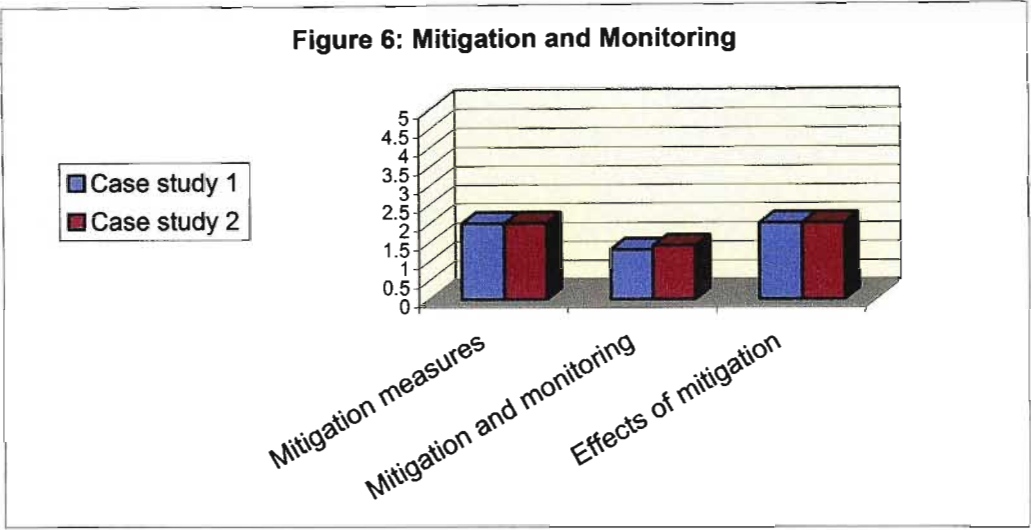


Although the ratings for screening, scoping and consultation reflect a measure of fluctuation between the various sub-categories, none of the case studies are allocated more than low compliance as per the respective sub-categories. The respective case studies were allocated similar ratings.

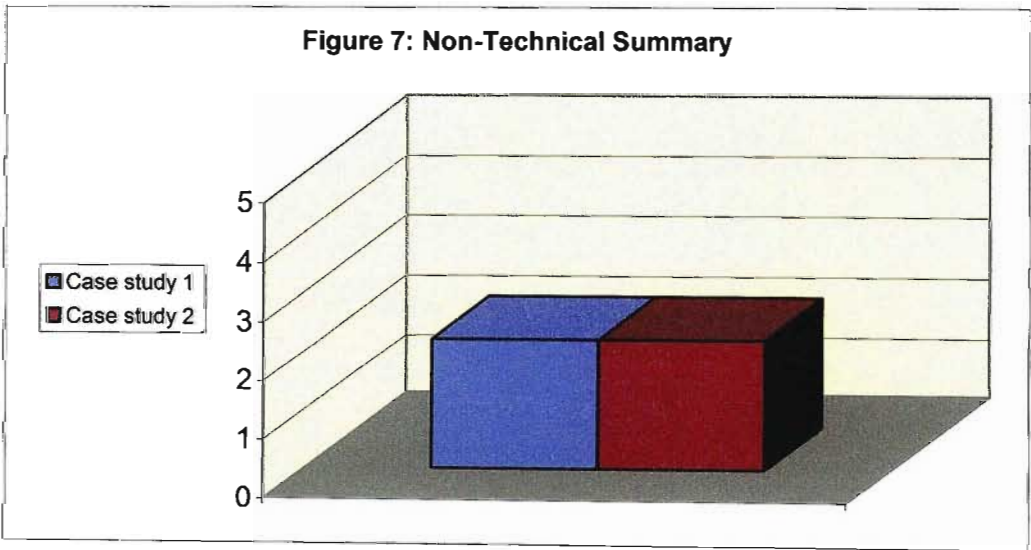


The ratings for impact prediction and evaluation reflect a measure of fluctuation between impact prediction and the other review categories. Apart

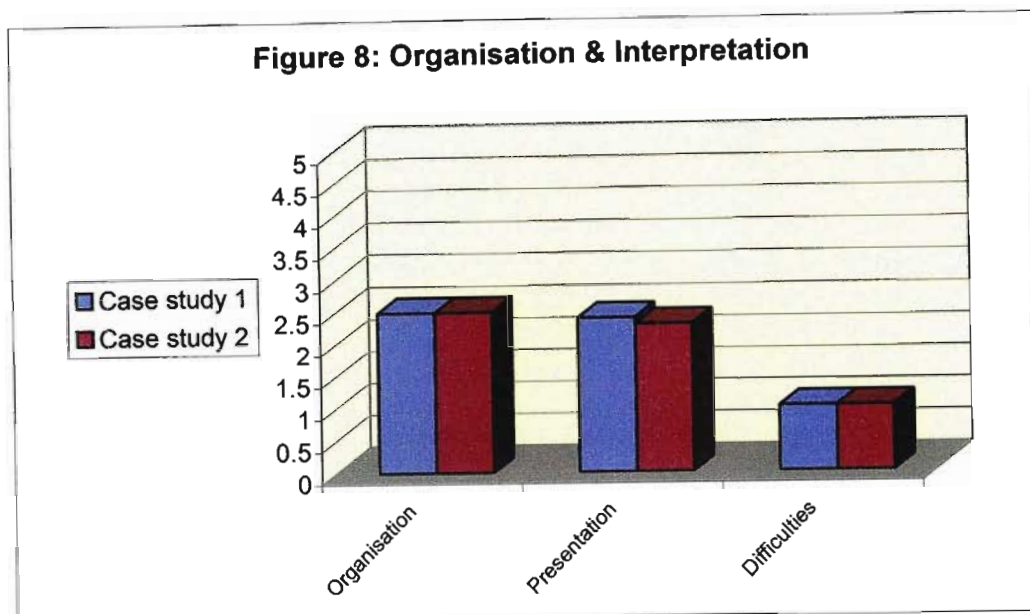
from impact prediction that was allocated moderate compliance, none of the case studies are allocated more than low compliance as per the respective sub-categories. The respective case studies were allocated similar ratings.



Although the ratings for mitigation and monitoring reflect a measure of fluctuation between the various sub-categories, none of the case studies are allocated more than low compliance as per the respective review categories. The respective case studies were allocated similar ratings.



Both case studies were allocated low compliance with regard to the non-technical summary.



Ratings allocated to the organisation and presentation of information as per the respective cases show almost no fluctuation and in both cases studies suggest low compliance. Both case studies were allocated similar ratings. A significantly lower rating of non-compliance is allocated with regard to difficulties experienced in compiling the information. Both case studies were allocated similar ratings in this regard.

4. DISCUSSION

A low compliance rating was allocated to the description of the development and the receiving environment in the respective case studies. This is the case despite the existence of relevant legislation, regulations and guideline documents. Boer & O'Brien (2002) suggest that this could in part be attributed to the reluctance of specialists to cross the disciplinary boundaries in order to include bigger picture effects. Le Maitre, Euston, Brown and Gelderblom (1997) add to the list of causal factors by referring to inadequate terms of reference for specialist studies and a failure to co-ordinate and integrate specialist studies.

The low compliance rating allocated to screening, scoping, consultation and impact identification could in part be ascribed to the prescriptive or “top down” nature of the scoping process described in Mafune *et al.* (1997) and a lack of uniform public participation processes and effective public participation (McDaid 2000). In addition Jardine, Nijenhuis, Owen and Hill (1997) and Ballot and Jansen (1997) warn against a tendency only to consider alternatives later on in the EIA process. McDaid (2000) refers to process manipulation by consultants with vested interests, a lack of a uniform public participation process and resultant public confusion, inadequate notification methods and logistical constraints experienced by interested and affected parties. Duma and Howard (1997) as well as Mitchell, Kaatz and Quayle (2000) mention that rural populations and disadvantaged groups are often not well served by the public participation process. According to Totman, Murphy and Pollett (1997) ignorance regarding the purpose of the EIA process often leads to it being incorrectly used for facilitation and negotiation. In the same vein Du Toit (2000) focuses on a tendency by a privileged few to derail EIA processes for purposes of their own agendas and benefit.

The low compliance rating allocated to impact prediction and evaluation can be related to a number of attributes. Winter and Hurt (2000:1) mentions a lack of structured methodology for assigning relative significance values to potential impacts. Luger, Laidler and Shand (2000) in turn question the credibility and “independence” of independent consultants if they are appointed and paid by the applicant, a concern that is also expressed by McDaid (2000). According to Le Maitre, Euston, Brown and Gelderblom, (1997) impacts on biodiversity are not being adequately addressed. According to Ballot and Jansen (1997) the nature of project-specific EIA's is such that cumulative effects are often not addressed. Van der Heyden, Mitchell and Megown (1999) ascribe this state of affairs to a lack of competencies in South Africa to evaluate cumulative impacts. On a more general note Le Maitre *et al.* (1997) express concern at the apparent inadequate prediction and evaluation of impacts.

A low compliance rating was allocated to mitigation and monitoring. To this end De Wit (2001:2) argues that trade-off models do not receive the explicit attention they deserve in environmental assessments in South Africa. Mafune *et al.* (1997) observe that social impacts were given far less attention than biophysical impacts in mitigation. Caution is also expressed at the small amount of concern for the monitoring and auditing of impacts as opposed to the emphasis normally placed on the stages leading up to the Record of Decision (Cubitt and Diab 2001; Katzchner 2001; Wood 1999). Du Preez, Haynes and Paton (1997) observe that there is limited reference and guidance to steps for mitigation of impacts during the post-decision stage of a project. According to them this often results in informed decisions being made with respect to the most environmentally sound development options, and the identification of mitigation measures, without formal provision for the implementation of recommendations. Shippey (1997) refer to the lack of legal enforceability of environmental mitigation and implementation measures.

The organisation and interpretation of information as well as the non-technical summaries of the respective case studies were allocated low compliance ratings. Greyling (2000) expresses concern over a lack of integration of public issues and technical assessment in EIA's. She ascribes this to a lack of understanding of the purpose and value of public participation, a lack of a common purpose among EIA team members, specialists viewing their work in isolation from other specialists in the team, team members not appreciating the value of local knowledge, public participation practitioners not understanding their responsibility as members of the EIA team and the respective mindsets and comfort zones of team members.

High compliance was allocated to the appropriateness of institutional controls. The relatively high rating for this category representing policy as opposed to the other categories representing practice denotes a gap between policy and practice.

5. CONCLUSIONS AND RECOMMENDATIONS

In the case study review, review categories were awarded an overall rating of low compliance with the exception of institutional controls. All review categories except the one for institutional controls therefore represent key improvement areas. In as far as parallels can be drawn between the results of the case study review and the state of EIA in South Africa, the overall quality of EIA in South Africa can be described as moderate to low with a significant disparity between the relatively high quality of policy and the relatively low quality of practice. The proper alignment of policy and practice is therefore regarded as priority.

Certain recommendations contained in relevant review studies that may lead to the improvement of quality in EIA in South Africa are herewith put forward.

- With regard to the description of the environment Boer & O'Brien (2002) recommend that specialist studies should not be confined by disciplinary boundaries but by issues of sustainability. For example reporting on biodiversity rather than commissioning separate animal and plant studies, or commissioning a health impact assessment rather than air and water quality studies.
- On screening, scoping, consultation and impact identification McDaid (2000) propose uniform public participation and impact significance assessment processes that can be partly achieved through the establishment of professional bodies and related communication channels. At the same time it is suggested that greater emphasis should be placed on trade-offs and social impacts. Ballot and Jansen (1997) propose the early consideration of alternatives, preferably already at the commencement of the screening and scoping stages. In order to promote public participation among rural and disadvantaged communities Duma and Howard (1997) recommend the introduction of environmental education and sensitisation programmes.

- With regard to impact prediction and evaluation Le Maitre *et al.* (1997) propose the development of guidelines to ensure that biodiversity assessments cover the important issues. Van der Heyden, Ballance, Evans, Murphy, Van Tienhoven and Wade (1998) refer to the poor incorporation of the cumulative effects philosophy in EIA and propose the development of databases on relevant expertise as well as the introduction of awareness programmes.
- Mitigation and monitoring measures and especially its application after the record of decision has been issued, must receive greater importance according to Shippey (1997). To this extent she proposes the prolonged involvement of an independent consultant in a project as appointed environmental control officer to oversee the implementation of the environmental management plan. With regard to the legal enforceability of mitigation measures she proposes strict fines. Ira, Reid, Spinks and Blaine (2000) recommend a legally binding EMP as part of a proposed development.
- Greyling (2000) addresses certain issues on the organisation and interpretation of information by stating that true integration between public issues and technical assessment can only be achieved when project teams are committed to a common, well-defined purpose. It must be mutually understood that the roles of technical assessment and public participation are equally important, and that these team members should be mutually accountable for their efforts. Considerable joint, up-front planning and ongoing interaction within the framework of a common purpose are required.

It was the purpose of the study to holistically review environmental impact assessment in South Africa. A broad scope for review criteria was therefore demarcated. Due to practical constraints two case studies were used. This is being acknowledged as a constraint that may have limited the range of

recommendations. The number of case studies also did not allow for provincial comparisons. The significance of this study should therefore be sought in the establishment of a comprehensive review framework rather than its application. The application of the review framework on a provincially representative selection of case studies may become the focus of subsequent case studies.

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Appendix 1: Review framework with combined ratings of case studies against review criteria

Rating scale:

- 1: Non-compliance
- 2: Low compliance
- 3: Moderate compliance
- 4: High compliance
- 5: Full compliance

<u>REVIEW CRITERIA</u>		<u>RATING:</u> <u>Case study 1</u>	<u>RATING:</u> <u>Case study 2</u>
1	<u>DESCRIPTION OF THE DEVELOPMENT</u>	<u>2.4</u>	<u>2.2</u>
1.1	Principle project features	2.4	2
A	Explanation of purpose & objectives of the development	2	2
B	Indication of the nature and status of the decision required	2	3
C	Indication of estimated duration of construction, operational and decommissioning phases	1	1
D	Description of development including design and scale (inclusion of diagrams & maps)	3	2
E	Indication of physical presence/appearance of completed development within receiving environment	3	1
F	Description of methods of construction	1	1
G	Description of nature and methods of production or other activities involved in operation of project	4	3
H	Description of additional services and developments required as a consequence of the project	1	1
I	Description of potential for accidents, hazards and emergencies	3	3
J	Inclusion of schematic drawings and discussions of the project's production processes and technology	4	3
1.2	Land requirements	3	3
A	Description of affected area, associated arrangements, auxiliary facilities etc (including maps)	3	3
B	Description and demarcation of envisaged land uses	3	3
C	Description of the re-instatement and after-use of landtake	N/A	N/A
1.3	Project inputs	1.3	1.3
A	Description of nature & quantities of materials needed during the construction & operational phases	1	1
B	Estimate of number of workers and visitors entering site both during construction & operation	2	2
C	Description of their access to the site and likely means of transport	1	1
D	Indication of methods to transport materials & products to and from site (construction & operation)	1	1
1.4	Residues & emissions	3	2.3
A	Estimated types & quantities of waste, energy & residual matter generated during construction & operation	4	3
B	Indication of how these materials will be disposed of	2	2

C	Identification of special or hazardous wastes to be produced and methods of disposal	4	2
D	Indication of methods of waste estimation and acknowledgement of uncertainties and confidence levels	2	2
2	<u>DESCRIPTION OF THE ENVIRONMENT</u>	2.3	2.3
2.1	Description of area occupied and surrounded by development	2.7	2.7
A	Indication of affected area including maps	3	3
B	Description of land uses on site and in surrounding areas	3	3
C	Definition of affected environment in broadest possible sense	2	2
2.2	Baseline conditions	1.9	1.9
A	Identification & description of components of environment potentially affected by the development	2	2
B	Biophysical, biological and social description of site	2	2
C	Description of methods used to investigate appropriateness of project (size & complexity of assessment)	2	2
D	Prediction of the likely future environmental conditions in the absence of the project	1	1
E	Use of existing technical data sources, including records and studies carried out	3	2
F	Review of local, regional and national plans & policies. Justification of departure where applicable.	2	3
G	Indication of involvement of local, regional and national agencies holding baseline information	1	1
3	<u>SCREENING, SCOPING, CONSULTATION AND IMPACT IDENTIFICATION</u>	2.1	2
3.1	Screening	1.3	1.3
A	Correctness of classification of proposal as to level and requirement for assessment	2	2
B	Evidence of other pre-submission decisions to provide environmental offsets	1	1
C	Pro-environmental pre-application modifications (eg. alteration of initial concept, alternatives etc.)	1	1
3.2	Scoping and consultation	2.4	2.3
A	Preparation of terms of reference / study guidelines	4	4
B	Proof of public participation including newspaper advertisement, on-site notice and correspondence	4	4
C	Consideration of likely extent of social dislocation	1	1
D	Consideration of degree of public concern/conflict that was evident	3	3
E	Consideration of potential and actual conflict of interest as referred to in the WPEMP	1	1
F	Consideration of the traditions of the affected people	1	1
G	Relevance of approaches & techniques applied to issues and constituencies involved	4	2
H	Availability of information on where reports can be obtained and examined	4	3
I	Involvement of key actors during all stages of process	2	3
J	Proof of governmental role player involvement and co-ordination as referred to in the WPEMP	3	3
K	Reference to role of environmental justice as referred to in the WPEMP	1	1
L	Identification of valued environmental attributes based on consultation & incorporation into documentation	3	3
M	Evidence of recognition of all forms of knowledge as referred to in the WPEMP	1	1
N	Selection of priority issues & key impacts for further investigation, description & justification of scoping methods used	3	3
O	Inclusion of copy or summary of main comments from role players & public, and responding measures	3	3
P	Completion of process that resulted in initial closure (positive record of decision)	1	1

3.3	Impact identification	2.5	2.5
A	Consideration of direct/indirect effect of development phases, also "consequential developments"	1	1
B	Investigation of these impacts to flora, fauna, soil, water, air, climate, landscape, material assets etc.	2	2
C	Investigation of noise, land use, historic heritage and communities (state clearly if not of concern)	2	2
D	Identification of impacts using a systematic methodology such as matrices, checklists etc. (describe)	4	4
E	Appropriateness of impact investigation to importance for decision & key issues	2	2
F	Consideration of incrementally significant impacts	1	1
G	Consideration of impacts that may arise from non-standard operating conditions, accidents & emergencies	4	4
H	Assessment of probable and likely consequences of accidents that may cause severe damage	4	4
4	<u>PREDICTION AND EVALUATION OF IMPACTS</u>	<u>2.4</u>	<u>2.4</u>
4.1	Prediction of magnitude of impacts	3.3	3.3
A	Description of impacts (nature & magnitude of change occurring & detail of affected receptors)	3	3
B	Prediction of the time scale of impacts – short, medium or long term, permanency and reversibility	3	3
C	Expression of impact predictions in quantitative terms as well as qualitative expressions where applicable	4	4
D	Description of the likelihood of impacts occurring and level of uncertainty attached to results	3	3
4.2	Methods & data	2.3	2.3
A	Methodology to predict nature, size & scale of impacts & importance (size & projected disturbance)	3	2
B	Description of data used to estimate size & scale of impacts and identification of sources and data gaps	2	2
C	Utilisation of suitable databases and methodologies	2	2
4.3	Evaluation of impact significance	1.9	2
A	Discussion of impact significance to local community and the protection of environmental resources	2	2
B	Description of ecological context	2	4
C	Description of international, national and provincial importance of proposed development	2	2
D	Discussion of available standards, assumptions and value systems for assessment of significance	2	2
E	Discussion of alternative approaches with distinction between fact, assumption & professional judgement	3	2
F	Description of method of assessing the significance of impacts	3	3
G	Discussion of significance to magnitude, location, duration, value, sensitivity and rarity of resources	3	3
H	Estimation and prediction of indirect and cumulative impacts	1	1
I	Evaluation of residual effects to potential severity including scope, duration & irreversibility	1	1
J	Discussion of / reference to alienation of resources as referred to in WPEMP	1	1
K	Differentiation of project generated impacts from other changes resulting from non-project activities	1	1
L	Inclusion of a clear indication of which impacts may be significant and which may not be significant	3	3
M	Consideration of link and interaction between environmental elements as referred to in WPEMP	1	1
N	Completion of process in necessary scope and depth	2	2
O	Evidence of full cost accounting as referred to in WPEMP	1	1
P	Consistency of information included with the process followed	3	3
4.4	Alternatives	2.2	2

A	Consideration of "no-action", process, layout, scale and operating alternatives (including "pros and cons")	3	2
B	Description of reasonable & feasible alternatives identified during scoping that may be further investigated	2	2
C	Re-appraisal of alternatives identified if unexpectedly severe adverse impacts are identified	1	1
D	Reasons for selecting the proposed project and the part environmental factors played in the selection	3	3
E	Credibility and realism of alternatives	2	2
F	Clear & objective comparison of alternatives' main environmental impacts with those of project	2	2
5	<u>MITIGATION & MONITORING</u>	<u>1.8</u>	<u>1.8</u>
5.1	Description of mitigation measures	2	2
A	Consideration of mitigation of all significant negative impacts including specific measures for each impact	3	3
B	Inclusion of mitigating measures for modification of project design, construction, pollution control etc.	2	2
C	Description of reasons for choosing a particular type of mitigation and other options available	2	2
D	Explanation of the extent to which mitigation methods will be effective (indicate uncertainty if applicable)	2	2
E	Indication of significance of residual or unmitigated impacts, and justification why it should not be mitigated	1	1
5.2	Commitment to mitigation and monitoring	1.3	1.4
A	Provision for clear base and condition setting	2	2
B	Environmental management plan including follow-up and monitoring arrangements	2	2
C	Detailed description of how mitigation measures will be implemented and function over required time span	1	1
D	Proposal for impact monitoring, especially in the case of uncertainty	1	2
E	Correspondence between proposed monitoring arrangements and potential scale impact deviations	1	1
F	Possibility of compensation or offset mechanisms including capacity building, skills transfer and education	1	1
G	Evidence of "polluter pays" principles as referred to in WPEMP	1	1
5.3	Environmental effects of mitigation	2	2
A	Investigation & description of any adverse environmental effects of mitigation measures	2	2
B	Consideration of the potential for conflict between the benefits of mitigation measures & its adverse impact	2	2
6	<u>NON-TECHNICAL SUMMARY</u>	<u>2.2</u>	<u>2.2</u>
A	Existence of non-technical summary of main findings (project description, mitigation, residual impacts etc.)	3	3
B	Avoidance of technical terms, list of data & detailed explanations of scientific reasoning in summary	4	4
C	Inclusion of main findings and issues of assessment in summary	2	2
D	Inclusion in summary of brief explanation of overall approach to the assessment	1	1
E	Indication in summary of the confidence which can be placed on the results	1	1
7	<u>ORGANISATION & INTERPRETATION OF INFORMATION</u>	<u>2.6</u>	<u>1.9</u>
7.1	Organisation of the information	2.5	2.5
A	Logical arrangement of information in sections	2	2
B	Identification of the location of information in a table or list of contents	4	4
C	Inclusion of chapter or section summaries outlining main findings of each phase of investigation	1	1
D	Inclusion of a full reference where external sources have been introduced	3	3

7.2	Presentation of information	2.4	2.3
A	Referral to relevant legislation and particulars of applicant and independent consultant	3	3
B	Inclusion of an introduction briefly describing the project, the aims of the assessment and methods used	3	3
C	Presentation of EIR as an integrated whole with full discussion in text of appendices	2	2
D	Existence of information and analysis to support all conclusions drawn	2	2
E	Presentation of information in a comprehensible non-technical manner with use of maps, tables etc.	3	3
F	Discussion of all important data and results in an integrated fashion	2	2
G	Avoidance of superfluous information (information not necessary for decision)	4	2
H	Presentation of information in a concise form with consistent terminology & logical links between sections	3	3
I	Allocation of prominence and emphasis to severe adverse impacts, benefits and controversial issues	2	2
J	Reliability of information included to established professional & disciplinary standards	2	2
K	Rigorous application of technical studies consistent with nature & complexity of issues	2	2
L	Conformation of work to prevailing standards of good science and EIA practice	2	2
M	Definition of technical terms, acronyms and initials	2	2
N	Objectivity of information (ensure that adverse impacts are not disguised by euphemisms and platitudes)	2	2
O	Defensibility of information to the risk and impact qualification as opposed to proposal uncertainties	2	2
P	Underlying presence of "cradle to grave" principle as referred to in WPEMP	2	2
Q	Availability to public review and expert comment (also refer to WPEMP)	3	3
7.3	Difficulties compiling the information	1	1
A	Indication of gaps in the required data and explanation of means to deal with it	1	1
B	Acknowledgement of difficulties in assembling or analysing the data needed to predict impacts	1	1
8	APPROPRIATENESS OF INSTITUTIONAL CONTROLS	4	4
A	Inclusion of clear legal provisions in EIA including allocation of functions	4	4
B	Inclusion of an explicit requirement to cover all environmentally	4	4
C	Clarity on respective roles and responsibilities of all role players	4	4
D	Inclusion of significant proposals	4	4
E	Inclusion of broad definition of environmental / coverage factors	4	4
F	Opportunities for public involvement throughout the process	4	4
G	Existence of procedures for independent, expert review of EIR's	4	4
H	Guidance on application of procedures, including proposal specific terms of reference	4	4
I	Agreed timelines for completion	4	4
J	Visible linkage to decision-making (e.g. approval, permitting etc. based on submission of report)	4	4
K	Specification of terms and conditions of implementation	4	4
L	Provisions for follow-up / monitoring	4	4
M	Enforceability of provisions	4	4

Appendix 2: Allocation and Motivation of Criteria Ratings

CRITERIA	CASE STUDY 1		CASE STUDY 2	
	Rating	Motivation	Motivation	Rating
1.1a	2	A clear and concise explanation of the purpose and objectives of the proposed development is not provided.	A clear and concise explanation of the purpose and objectives of the proposed development is not provided.	2
1.1b	2	An indication of the nature and status of the decision required is briefly given in the introduction (p. 1).	An indication of the nature and status of the decision required is being alluded to in the introduction (p. 1). Reference is made in passing to relevant legislation and related approvals (pp. 89-90).	3
1.1c	1	An indication of the estimated duration of construction, operational and decommissioning phases is not provided.	An indication of the estimated duration of construction, operational and decommissioning phases is not provided.	1
1.1d	3	A description of the generic design process of the proposed development is provided as well as generic scales and quantities with diagrams (pp. 2-5 & Annexure B). Projected project specific scales and quantities are also provided (p. 36).	A description of the generic design process of the proposed development is provided (pp. 3-10) as well as generic scales and quantities with diagrams (Annexure B). No reference is made to project specific scales and quantities.	2
1.1e	3	An indication is provided of the physical presence / appearance of the completed development within the receiving environment through the inclusion of pictures of building to be used (pp. 73-77). These pictures do not provide a complete indication of the future physical appearance of the project.	No indication is provided of the physical presence / appearance of the completed development within the receiving environment.	1
1.1f	1	A description of methods of construction is not provided.	A description of methods of construction is not provided.	1
1.1g	4	A description is provided of the nature and methods of production and other activities involved in the operation of the project (overview of incineration process, emissions control etc.). A list of possible emissions including furans and dioxins is provided (Annexure B).	A description is provided of the nature and methods of production and other activities involved in the operation of the project (overview of incineration process, emissions control etc.). A full list of possible emissions is not provided e.g. dioxins & furans not mentioned).	3
1.1h	1	A description of additional services and developments required as a consequence of the project is not provided.	A description of additional services and developments required as a consequence of the project is not provided.	1

1.1i	3	A description and assessment of potential for the following accidents, hazards and emergencies is provided (pp. 32-34): Leaching of medical waste, release of medical waste effluent, exposure of employees to bio-hazardous wastes, emissions, uncontrolled storm water & possible explosion; Waste management emergency plan also included (Annexure I).	A description and assessment of potential for the following accidents, hazards and emergencies is provided (pp. 21-23): Leaching of medical waste, release of medical waste effluent, exposure of employees to bio-hazardous wastes, emissions, uncontrolled storm water & possible explosion; Waste management emergency plan also included (Annexure D).	3
1.1j	4	A discussion of the project's production processes and technology as well as schematic drawings are included (Annexure B).	A discussion of the project's production processes and technology as well as schematic drawings are included (Annexures B & C). All possible types of emissions not listed.	3
1.2a	3	The following description of the affected area is provided together with supporting tables (p. 20-22): Geology and soils, climate, ecological assessment, animal life, sensitive areas and social environment. No elaboration on associated arrangements & auxiliary facilities (e.g. waste disposal site). Maps and schematic drawings consist of 1:50 000 & street map extracts (Annexure A) as well as sketch illustrating the design features & site layout of proposed project (Annexure D).	The following description of the affected area is provided together with supporting tables (p. 12-14): Geology and soils, climate, ecological assessment, animal life, sensitive areas and social environment. No elaboration on associated arrangements & auxiliary facilities (e.g. waste disposal site). Maps and schematic drawings consist of 1:50 000 & street map extracts (Annexure A) as well as sketch illustrating the design features and site layout of proposed incinerator (Annexure B).	3
1.2b	3	A description and demarcation of envisaged land uses on site is contained in a layout plan (Annexure D). The layout plan does not include references to adjacent land uses.	A description and demarcation of envisaged land uses on site is contained in a layout plan (Annexure B). The layout plan does not include references to adjacent land uses.	3
1.2c	N/A	Description of the re-instatement and after-use of land take is not applicable since an existing and improved industrial site is being proposed as project site.	Description of the re-instatement and after-use of land take is not applicable since an existing and improved industrial site is being proposed as project site.	N/A
1.3a	1	A description of the nature & quantities of materials needed during the construction and operational phases is not provided.	A description of the nature & quantities of materials needed during the construction and operational phases is not provided.	1
1.3b	2	An estimate of the number of workers and visitors entering the site both during the construction phase is not provided. An estimate of workers during the initial operational phase is provided.	An estimate of the number of workers and visitors entering the site both during the construction phase is not provided. An estimate of workers during the initial operational phase is provided.	2
1.3c	1	A description of their access to the site and likely means of transport is not provided.	A description of their access to the site and likely means of transport is not provided.	1
1.3d	1	An indication of methods to transport materials & products to and from site (construction & operation) is not provided.	An indication of methods to transport materials & products to and from site (construction & operation) is not provided.	1

1.4a	4	Generic estimated types & quantities of waste, energy and residual matter are provided (P. 40 & Annexure B). These estimations are augmented by a project specific air pollution impact assessment (Annexure H).	Generic estimated types & quantities of waste, energy and residual matter are provided (Annexure I).	3
1.4b	2	An indication of how these materials will be disposed of (method of transport, location of waste disposal site etc.) is not included apart from brief reference to the service provider to be used.	An indication of how these materials will be disposed of (method of transport, location of waste disposal site etc.) is not included apart from brief reference to the service provider to be used.	2
1.4c	4	An identification of special or hazardous wastes / emissions is provided.	An identification of special or hazardous wastes / emissions is provided but do not include reference to dioxins, furans & mercury.	2
1.4d	2	Methods of waste estimation are not described. Very little reference is made to uncertainties and confidence levels (i.e. the impact of emissions on the health of the receiving population).	Methods of waste estimation are not described. Very little reference is made to uncertainties and confidence levels (i.e. the impact of emissions on the health of the receiving population).	2
2.1a	3	Refer to 1.2a.	Refer to 1.2a.	3
2.1b	3	A brief description of land uses on-site and in surrounding areas is provided (pp. 15, 18 & 22). The necessary detail (estimated populations and other demographical information) is lacking.	A brief description of land uses on-site and in surrounding areas is provided (p. 14, Annexure B). The necessary detail (estimated populations and other demographical information) is lacking.	3
2.1c	2	The definition of the affected area in its broadest possible sense consists mainly of broad geo-physical, bio-physical and social indicators. These indicators are not informed by specialist studies such as geotechnical studies, social scans etc.. It also does not extend to issues such as baseline health conditions & existing ambient levels of air pollution.	The definition of the affected area in its broadest possible sense consists mainly of broad geo-physical, bio-physical and social indicators. These indicators are not informed by specialist studies such as geotechnical studies, social scans etc.. It also does not extend to issues such as baseline health conditions & existing ambient levels of air pollution.	2
2.2a	2	Refer to 2.1c.	Refer to 2.1c.	2
2.2b	2	Refer to 2.1c	Refer to 2.1c	2
2.2c	2	Appropriateness of project investigation was determined in terms of legislative requirements. This method however was not described as such in the report.	Appropriateness of project investigation was determined in terms of legislative requirements. This method however was not described as such in the report.	2
2.2d	1	No prediction is made of the likely future environmental conditions in the absence of the project. The no-project option does not receive any consideration.	No prediction is made of the likely future environmental conditions in the absence of the project. The no-project option does not receive any consideration.	1

2.2e	3	Technical data sources, including records and studies carried out mainly consist of generic technical specifications of the proposed incinerator as well as comparative emission data as well as an air pollution impact assessment (Annexures B, H, M & N).	Technical data sources, including records and studies carried out mainly consist of generic technical specifications of the proposed incinerator. Notably lacking is emission data on similar incinerators or the existing incinerator and a full list of emissions which may be produced by the incinerator.	2
2.2f	2	Little reference is made to the existence of relevant local, regional & national plans & policies. No mention is made of the Guidelines for incineration issued by DEAT, requirements for the transportation of bio-hazardous waste, and plans and policies on issues such as spatial frameworks and government's integrated waste management strategy.	The following reference is made to the existence of relevant local, regional & national plans & policies: Guidelines for incineration issued by DEAT (Annexure C); Requirements for the transportation of bio-hazardous waste (Annexure O). Plans and policies on issues such as spatial frameworks and government's integrated waste management strategy are not mentioned and discussed as such.	3
2.2g	1	No indication is given of involved local, regional & national agencies holding baseline information.	No indication is given of involved local, regional & national agencies holding baseline information.	1
3.1a	2	The proposal is correctly classified as to level and requirement for assessment. However, reference is not made to its correct classification as listed activity in terms of ECA.	The proposal is correctly classified as to level and requirement for assessment. However, reference is not made to its correct classification as listed activity in terms of ECA.	2
3.1b	1	No evidence exists of other pre-submission decisions to provide environmental offsets.	No evidence exists of other pre-submission decisions to provide environmental offsets.	1
3.1c	1	No evidence exists of pro-environmental pre-application modifications (e.g. alteration of initial concept, alternatives etc.)	No evidence exists of pro-environmental pre-application modifications (e.g. alteration of initial concept, alternatives etc.)	1
3.2a	4	Preparation of terms of reference / study guidelines is embodied in the relevant plan of study for scoping consisting of the following: Objective and approach of the scoping process to be followed; and a description of the proposed public participation process.	Preparation of terms of reference / study guidelines is embodied in the relevant plan of study for scoping consisting of the following: Objective and approach of the scoping process to be followed; and a description of the proposed public participation process.	4
3.2b	4	The following proof of public participation is provided: Copies of newspaper advertisements (Annexure G), affidavit confirming placement of on-site notice (Annexure L), minutes of environmental scoping meeting (Annexure G) & correspondence (Annexure K). Certain omissions on I&AP list (e.g. Legal Resources Centre & Ground Work).	The following proof of public participation is provided: Copies of newspaper advertisements (Annexure E), affidavit confirming placement of on-site notice, minutes of environmental scoping meeting (Annexure G) & correspondence (Annexures H, I, J, K, L, M & N). Time of meeting 12h00 on a Friday.	4
3.2c	1	No consideration is given to the likely extent of social dislocation.	No consideration is given to the likely extent of social dislocation.	1

3.2d	3	Consideration of degree of public concern / conflict that was present consists of the following: Inclusion of issues that were raised during environmental scoping meeting as well as comments (pp. 36-38); Inclusion of correspondence received from I&AP's and responses (Annexure K).	Consideration of degree of public concern / conflict that was present consists of the following: Inclusion of issues that were raised during environmental scoping meeting as well as comments (pp. 20-85); Inclusion of correspondence received from I&AP's and responses (Annexures H, I, J, K, L, M & N).	3
3.2e	1	Specific consideration is not given to potential & actual conflict of interest as referred to in the WPEMP (e.g. Capital gain vs. public health).	Specific consideration is not given to potential & actual conflict of interest as referred to in the WPEMP (e.g. Capital gain vs. public health).	1
3.2f	1	No evidence exists indicating that the traditions of the affected people were considered, either in terms of a social impact assessment or otherwise.	No evidence exists indicating that the traditions of the affected people were considered, either in terms of a social impact assessment or otherwise.	1
3.2g	4	Approaches & techniques applied to issues and constituencies involved appear to be relevant and appropriate (e.g. air pollution impact assessment and reference to test results of similar incinerators).	The relevance of approaches & techniques applied to issues and constituencies involved may in certain instances be questioned. For example the following relevant approaches and techniques are absent: A full assessment of all emissions which may result from the incineration process; and a detailed assessment of the clinical waste stream.	2
3.2h	4	Copies of the draft scoping report were made available to the public at the Benoni public library as well as the proponent's office. Although notification of this was given in on 20 December a period of 45 days was allowed for comment.	Copies of the draft scoping report were made available to the public at the Germiston library as well as the proponent's office. Notification of this was given in December and an initial period of two weeks was allowed for comment. Given that it was distributed in a month when traditionally people take leave the arrangement cannot be considered to be satisfactory. Also no copies were available for inspection at a venue situated in affected communities.	3
3.2i	2	Involvement of key actors did not occur from the initial stages of process but did increase during the public participation process to include the active participation of Earthlife Africa, Legal Resources Centre & Ground Work. However, the list of registered I&AP's (Annexure K) do not reflect the names of these mentioned organisations.	Involvement of key actors did not occur from the initial stages of process but did increase during the public participation process to include the active participation of Earthlife Africa, Wildlife & Environment Society of South Africa, Environmental Justice Networking Forum, Legal Resources Centre, Ground Work and The Lambton Area Residents' Association (pp. 18-20).	3

3.2j	3	Proof of the following governmental role player involvement and co-ordination as referred to in the WPEMP is provided (pp.17-18, Annexure C, F, H, N & O): The Gauteng Department of Agriculture, Conservation, Environment and Land Affairs; Department of Water Affairs & Forestry; Department of Environmental Affairs & Tourism; Greater Germiston Council.	Proof of the following governmental role player involvement and co-ordination as referred to in the WPEMP is provided (pp.17-18, Annexure C, F, H, N & O): The Gauteng Department of Agriculture, Conservation, Environment and Land Affairs; Department of Water Affairs & Forestry; Department of Environmental Affairs & Tourism; Greater Germiston Council.	3
3.2k	1	No specific reference is made to the role of environmental justice as referred to in WPEMP.	No specific reference is made to the role of environmental justice as referred to in WPEMP.	1
3.2l	3	Environmental attributes were identified and incorporated into documentation based on issues identified during the public participation process (pp. 32-35)	Environmental attributes were identified and incorporated into documentation based on issues identified during the public participation process (pp. 21-23)	3
3.2m	1	No evidence exists that all forms of knowledge as referred to in the WPEMP are recognised.	No evidence exists that all forms of knowledge as referred to in the WPEMP are recognised.	1
3.2n	3	Priority issues & key impacts are selected for further investigation (pp. 32-35). Further investigation does not take place in a structured manner. A description is given of scoping methods used, without any justification.	Priority issues & key impacts are selected for further investigation (pp. 20-23). Further investigation does not take place in a structured manner. A description is given of scoping methods used, without any justification.	3
3.2o	3	A summary of main comments from role players & public, and responding measures are provided (pp. 24-85 & Annexures H, I, J, K, L, M & N).	A summary of main comments from role players & public, and responding measures are provided (pp. 24-85 & Annexures H, I, J, K, L, M & N).	3
3.2p	1	Completion of process that resulted in initial closure (positive Record of Decision) did not take place since an EIR was requested.	Completion of process that resulted in initial closure (positive Record of Decision) did not take place since an EIR was requested.	1
3.3a	1	Consideration is not given to the direct/indirect effect of development phases as well as "consequential developments"	Consideration is not given to the direct/indirect effect of development phases as well as "consequential developments"	1
3.3b	2	These impacts are not investigated in detail in terms of flora, fauna, soil, water, air, climate, landscape, material assets etc.	These impacts are not investigated in detail in terms of flora, fauna, soil, water, air, climate, landscape, material assets etc.	2
3.3c	2	Noise, land use, historic heritage and communities are not investigated in detail.	Noise, land use, historic heritage and communities are not investigated in detail.	2
3.3d	4	Impacts were identified and assessed using a systematic rating and ranking methodology taking into account probability, intensity, duration, severity and significance (Annexure C).	Impacts were identified and assessed using a systematic rating and ranking methodology taking into account probability, intensity, duration, severity and significance (Annexure D).	4

3.3e	2	Impact investigation not entirely appropriate in terms of importance for decision & key issues. All potential environmental impacts were not identified (e.g. full range of emissions) and inadequate information regarding the environmental impacts and its significance is available (e.g. no detailed description of medical waste stream to enter incinerator) for purposes of decision making.	Impact investigation not entirely appropriate in terms of importance for decision & key issues. All potential environmental impacts were not identified (e.g. full range of emissions) and inadequate information regarding the environmental impacts and its significance is available (e.g. no detailed description of medical waste stream to enter incinerator) for purposes of decision making.	2
3.3f	1	No consideration is given to incrementally significant impacts (e.g. small amount of chlorine that can lead to the formation of dioxins & furans).	No consideration is given to incrementally significant impacts (e.g. small amount of chlorine that can lead to the formation of dioxins & furans).	1
3.3g	4	Consideration of impacts that may arise from non-standard operating conditions, accidents & emergencies is contained in an evaluation of the emergency plan as well as an occupational environmental health risk management plan.	Consideration of impacts that may arise from non-standard operating conditions, accidents & emergencies is contained in an evaluation of the emergency plan as well as an occupational environmental health risk management plan.	4
3.3h	4	Assessment of probable and likely consequences of accidents that may cause severe damage is addressed in an environmental health risk assessment.	Assessment of probable and likely consequences of accidents that may cause severe damage is addressed in an environmental health risk assessment.	4
4.1a	3	A description of impacts is provided and discussed in terms of nature and magnitude of change occurring (pp. 32-34). Lesser emphasis is placed on details of affected receptors.	A description of impacts is provided and discussed in terms of nature and magnitude of change occurring (pp. 21-23). Lesser emphasis is placed on details of affected receptors.	3
4.1b	3	A prediction of the time scale of impacts (short term= 0-5 years, medium term = 15-15 years, long term = impact will only cease after the operational life of the activity) is provided. Lesser emphasis is placed on permanency and reversibility.	A prediction of the time scale of impacts (short term= 0-5 years, medium term = 15-15 years, long term = impact will only cease after the operational life of the activity) is provided. Lesser emphasis is placed on permanency and reversibility.	3
4.1c	4	Expression of impact predictions in terms of the set criteria contains both qualitative and quantitative elements.	Expression of impact predictions in terms of the set criteria contains both qualitative and quantitative elements.	4
4.1d	3	The likelihood of impacts occurring as well as the uncertainty attached to results is contained in the probability and significance allocated to each impact (pp. 32-34) and not discussed separately.	The likelihood of impacts occurring as well as the uncertainty attached to results is contained in the probability and significance allocated to each impact and not discussed separately.	3

4.2a	3	The size and projected disturbance of impacts are predicted in terms of pre-set criteria. Some of these criteria (timing, duration & extent) are assessed based on figures and facts from studies and research. Studies and research mainly consist of generic estimates and an air quality impact assessment, and not actual trial tests. Others (probability, severity/ intensity and significance) are assessed subjectively based on rule-of-thumb and experience.	The size and projected disturbance of impacts are predicted in terms of pre-set criteria. Some of these criteria (timing, duration & extent) are assessed based on figures and facts from studies and research. Studies and research mainly consist of generic estimates and not actual trial tests. Others (probability, severity/ intensity and significance) are assessed subjectively based on rule-of-thumb and experience.	2
4.2b	2	Data and sources used to estimate size & scale of impacts are not discussed and referred to before an assessment is made. Little emphasis is placed on data gaps.	Data and sources used to estimate size & scale of impacts are not discussed and referred to before an assessment is made. Little emphasis is placed on data gaps.	2
4.2c	2	Databases and methodologies consulted may not be appropriate and sufficient on its own and may need to be complemented by actual baseline studies (e.g. prevailing health standards and air quality) and trial emission tests.	Databases and methodologies consulted may not be appropriate and sufficient on its own and may need to be complemented by actual baseline studies (e.g. prevailing health standards and air quality) and trial emission tests.	2
4.3a	2	Impact significance is not discussed in detail in terms of local community and the protection of the environment except for a brief separate discussion of social and bio-physical impacts (pp. 39-42).	Impact significance is not discussed in detail in terms of local community and the protection of the environment except for a brief separate discussion of social and bio-physical impacts (pp. 86-88).	2
4.3b	2	The ecological context consists of a brief discussion of vegetation and animal life (p. 21) It is not supported by an ecological assessment.	The ecological context is described in an ecological assessment that was done for purposes of the report.	4
4.3c	2	No specific reference is made to the importance of the proposed development in terms of local and regional economic development opportunities as well as foreign capital.	No specific reference is made to the importance of the proposed development in terms of local and regional economic development opportunities as well as foreign capital.	2
4.3d	2	Available standards, assumptions & value systems for assessment of significance are not discussed in depth.	Available standards, assumptions & value systems for assessment of significance are not discussed in depth.	2
4.3e	3	A broad range of alternative approaches are discussed (pp. 9-15). A clear distinction between fact, assumption and professional judgement is not made (e.g. certain methods are simply dismissed as being too expensive without providing cost comparisons). Most possible alternative approaches are listed.	Alternative approaches are discussed (pp. 10-11). A clear distinction between fact, assumption and professional judgement is not made. All possible alternative approaches are not listed.	2
4.3f	3	A brief description of the method of assessing the significance of impacts is provided (Annexure C).	A brief description of the method of assessing the significance of impacts is provided (p. 15, Annexure D).	3

4.3g	3	Significance of impacts is discussed in terms of probability, intensity, duration, severity and significance. It is not as such discussed in terms of magnitude, value, sensitivity and rarity of resources.	Significance of impacts is discussed in terms of probability, intensity, duration, severity and significance. It is not as such discussed in terms of magnitude, value, sensitivity and rarity of resources.	3
4.3h	1	No estimation and prediction of indirect and cumulative impacts is provided.	No estimation and prediction of indirect and cumulative impacts is provided.	1
4.3i	1	Residual effects are not evaluated in terms of potential severity including scope, duration & irreversibility.	Residual effects are not evaluated in terms of potential severity including scope, duration & irreversibility.	1
4.3j	1	There is no discussion of / reference to the alienation of resources as referred to in WPEMP.	There is no discussion of / reference to the alienation of resources as referred to in WPEMP.	1
4.3k	1	No differentiation between project generated impacts and other changes resulting from non-project activities is made.	No differentiation between project generated impacts and other changes resulting from non-project activities is made.	1
4.3l	3	An indication is given of which impacts are considered to be significant and which may not be significant (pp. 32-34).	An indication is given of which impacts are considered to be significant and which may not be significant (pp. 21-23).	3
4.3m	1	Consideration is not given to links and interaction between environmental elements as referred to in WPEMP	Consideration is not given to links and interaction between environmental elements as referred to in WPEMP	1
4.3n	2	The following considerations suggest that the process was not completed in necessary scope and depth: The report does not provide adequate information to enable I&AP's and the authorities to apply their minds to an assessment of the potential impacts the proposed development may have on the environment and health of receptors; The report omits certain important information on the potential impacts that the incinerator may have; The report fails to identify any issues that should further be investigated in an EIA.	The following considerations suggest that the process was not completed in necessary scope and depth: The report does not provide adequate information to enable I&AP's and the authorities to apply their minds to an assessment of the potential impacts the proposed development may have on the environment and health of receptors; The report omits certain important information on the potential impacts that the incinerator may have; The report fails to identify any issues that should further be investigated in an EIA.	2
4.3o	1	There is no evidence of full cost accounting as referred to in WPEMP, both in terms of financial and other terms (such as health and well-being).	There is no evidence of full cost accounting as referred to in WPEMP, both in terms of financial and other terms (such as health and well-being).	1
4.3p	3	Information included generally corresponds with the process followed.	Information included generally corresponds with the process followed.	3
4.4a	3	The consideration of alternatives does not include the "no-action" alternative. Although reference is made to process alternatives (pp. 9-16), no attention is given to layout, scale and operating alternatives. Reference is made to four different locations that were considered (pp.16-20).	The consideration of alternatives does not include the "no-action" alternative. Although reference is made to process alternatives (pp. 10-11), no attention is given to layout, scale and operating alternatives. Only brief reference is made to the issue of alternative locations (pp. 2-3).	2

4.4b	2	The report does not identify any feasible alternatives that may be further investigated.	The report does not identify any feasible alternatives that may be further investigated.	2
4.4c	1	Alternatives were not re-appraised during the scoping process despite the identification of various issues and concerns regarding the proposed development.	Alternatives were not re-appraised during the scoping process despite the identification of various issues and concerns regarding the proposed development.	1
4.4d	3	Reasons for selecting the proposed project are mentioned briefly in the introduction (p. 1). The following environmental factors are mentioned as having played a part in the selection: Zoning (spatial), existing infrastructure (financial), close proximity to haulers (financial). Factors not considered include health, needs analysis and alignment with government's integrated waste management strategy	Reasons for selecting the proposed project are mentioned briefly in the introduction (p. 1). The following environmental factors are mentioned as having played a part in the selection: Zoning (spatial), existing infrastructure (financial), close proximity to haulers (financial). Factors not considered include health, needs analysis and alignment with government's integrated waste management strategy	3
4.4e	2	The consideration of alternatives is not characterised by a fair amount of credibility and realism since it displays a pre-disposition towards incineration. It also does not include copies on studies conducted on alternatives from which conclusions are drawn. Furthermore detailed cost comparisons (direct and indirect) between alternatives are not made.	The consideration of alternatives is not characterised by a fair amount of credibility and realism since it displays a pre-disposition towards incineration. It also does not include copies on studies conducted on alternatives from which conclusions are drawn. Furthermore detailed cost comparisons (direct and indirect) between alternatives are not made.	2
4.4f	2	The main environmental impacts of alternatives do not receive equal comparison with the main environmental impacts of project options.	The main environmental impacts of alternatives do not receive equal comparison with the main environmental impacts of project options.	2
5.1a	3	Most significant negative impacts as identified during the impact assessment process have been assigned specific mitigating/management measures (pp.32-34).	Most significant negative impacts as identified during the impact assessment process have been assigned specific mitigating/management measures (pp. 23-25).	3
5.1b	2	Mitigating measures allowing for the modification of aspects of project design, construction, pollution control etc. is not included.	Mitigating measures allowing for the modification of aspects of project design, construction, pollution control etc. is not included.	2
5.1c	2	Reasons for choosing a particular type of mitigation measure and other options available are not included.	Reasons for choosing a particular type of mitigation measure and other options available are not included.	2
5.1d	2	No clear indication of the extent to which mitigation methods will be effective as well as the amount of uncertainty is provided.	No clear indication of the extent to which mitigation methods will be effective as well as the amount of uncertainty is provided.	2
5.1e	1	No indication is given of the significance of residual or unmitigated impacts as well as justification why it should not be mitigated is provided.	No indication is given of the significance of residual or unmitigated impacts as well as justification why it should not be mitigated is provided.	1

5.2a	2	Provision for clear base and condition setting is not made in the report. Apart from an overview of the environment to be affected (pp. 20-22) several base conditions (e.g. existing air quality tests and existing health assessments amongst receptors) are not provided. Furthermore issues and possible mitigation measures are not translated into conditions to be contained in a draft environmental management plan.	Provision for clear base and condition setting is not made in the report. Apart from an overview of the environment to be affected (pp. 12-14) several base conditions (e.g. existing air quality tests and existing health assessments amongst receptors) are not provided. Furthermore issues and possible mitigation measures are not translated into conditions to be contained in a draft environmental management plan.	2
5.2b	2	The report does not translate issues and impacts into a draft environmental management plan including follow-up and monitoring arrangements.	The report does not translate issues and impacts into a draft environmental management plan including follow-up and monitoring arrangements.	2
5.2c	1	A detailed description of how mitigation measures will be implemented and function over the required time span is not included.	A detailed description of how mitigation measures will be implemented and function over the required time span is not included.	1
5.2d	1	The report does not contain recommendations for impact monitoring, especially in the case of uncertainty.	Apart from a recommendation to conduct stack monitoring and to monitor health stressors the report does not contain proposals for impact monitoring, especially in the case of uncertainty. The recommendations are not supported by detailed monitoring specifications.	2
5.2e	1	No correspondence exists between proposed monitoring arrangements and potential scale impact deviations	Limited correspondence exists between proposed monitoring arrangements and potential scale impact deviations	1
5.2f	1	The report does not include the possibility of compensation or offset mechanisms including capacity building, skills transfer and education.	The report does not include the possibility of compensation or offset mechanisms including capacity building, skills transfer and education.	1
5.2g	1	The report does not contain any evidence of "polluter pays" principles as referred to in WPEMP.	The report does not contain any evidence of "polluter pays" principles as referred to in WPEMP.	1
5.3a	2	Adverse environmental effects of mitigating measures are not investigated and described. This may be the case since such effects are not being envisaged in the report.	Adverse environmental effects of mitigating measures are not investigated and described. This may be the case since such effects are not being envisaged in the report.	2
5.3b	2	The potential for conflict between the benefits for mitigation measures and its adverse impact is not considered. This may be the case since such adverse impacts are not being envisaged in the report.	The potential for conflict between the benefits for mitigation measures and its adverse impact is not considered. This may be the case since such adverse impacts are not being envisaged in the report.	2
6a	3	A non-technical summary of the main findings of the report is included (pp. 42-44). The summary however does not give an overview of all process phases (such as the public participation process).	A non-technical summary of the main findings of the report is included (pp. 88-91). The summary however does not give an overview of all process phases (such as the public participation process).	3

6b	4	The summary avoids technical terms, lists of data and detailed explanations of scientific reasoning.	The summary avoids technical terms, lists of data and detailed explanations of scientific reasoning.	4
6c	2	The summary document does not provide main findings and issues of assessment for all phases and aspects of the process (e.g. overview of affected environment, environmental aspects, impacts and issues identified, outcome of the public participation process and social impacts).	The summary document does not provide main findings and issues of assessment for all phases and aspects of the process (e.g. overview of affected environment, environmental aspects, impacts and issues identified, outcome of the public participation process and social impacts).	2
6d	1	A brief explanation of the overall approach to the assessment is not included in the summary.	A brief explanation of the overall approach to the assessment is not included in the summary.	1
6e	1	The summary document does not provide an indication of the confidence that can be placed on the results.	The summary document does not provide an indication of the confidence that can be placed on the results.	1
7.1a	2	Information is arranged in the prescribed sections. Issues however are not arranged in any logical order be it order of significance or the respective environmental components.	Information is arranged in the prescribed sections. Issues however are not arranged in any logical order be it order of significance or the respective environmental components.	2
7.1b	4	A comprehensive list of contents whereby information can be easily located is provided.	A comprehensive list of contents whereby information can be easily located is provided.	4
7.1c	1	Chapter or section summaries of each phase of investigation are not included.	Chapter or section summaries of each phase of investigation are not included.	1
7.1d	3	A full reference where external sources have been introduced is not included. A list of appendices is provided.	A full reference where external sources have been introduced is not included. A list of appendices is provided.	3
7.2a	3	Referral is made to the provisions of Sections 21, 22 and 26 of ECA (p. 1). No mention is made of Sections 2 and 24(7) of NEMA. Particulars of applicant and independent consultant are provided in a distribution list.	Referral is made to the provisions of Sections 21, 22 and 26 of ECA (p. 1). No mention is made of Sections 2 and 24(7) of NEMA. Particulars of applicant and independent consultant are provided in a distribution list.	3
7.2b	3	An introduction briefly describing the project and the aims of the assessment is included (pp. 1-8). Lesser attention is given to methods used.	An introduction briefly describing the project and the aims of the assessment is included (pp. 1-2). Lesser attention is given to methods used.	3
7.2c	2	The report is not presented as an integrated whole with full discussion in text of appendices. Insufficient attention is given to the translation of issues and impacts into measures that represent the essence of an environmental management plan. Although a comprehensive list of appendices is included it does not include all required information (such as baseline air quality tests and baseline health indicators).	The report is not presented as an integrated whole with full discussion in text of appendices. Insufficient attention is given to the translation of issues and impacts into measures that represent the essence of an environmental management plan. Although a comprehensive list of appendices is included it does not include all required information (such as baseline air quality tests and baseline health indicators).	2

7.2d	2	Information and analysis included in the report do not support all conclusions drawn. One of the final conclusions drawn is that the risks associated with the proposed incinerator will be acceptable, provided that recommended mitigating measures are implemented. It is debatable if such a conclusion can be drawn if actual trial emission tests were not available and referred to in the study.	Information and analysis included in the report do not support all conclusions drawn. One of the final conclusions drawn is that the risks associated with the proposed incinerator will be acceptable, provided that recommended mitigating measures are implemented. It is debatable if such a conclusion can be drawn if all potential impacts (such as the production of dioxins and furans) were not considered in the study.	2
7.2e	3	Information is presented in a comprehensible non-technical manner with use of maps, tables etc.	Information is presented in a comprehensible non-technical manner with use of maps, tables etc.	3
7.2f	2	All important data and results are not discussed in an integrated fashion.	All important data and results are not discussed in an integrated fashion.	2
7.2g	4	Superfluous information (information not necessary for decision) is avoided in most instances. Specialist studies such as the air pollution impact assessment and comparative emission tests are particularly relevant.	Superfluous information (information not necessary for decision) is not avoided in all instances. For example sixty-one pages of the 91 pages are dedicated to issues raised during the environmental scoping meeting. Although this information may be included as an appendix it is not functional as part of the main report, especially since it is not directly linked to possible mitigation.	2
7.2h	3	Information is predominantly presented in concise form with consistent terminology. It does not contain logical links between sections in that issues identified are not translated into environmental management measures representing the essence of a draft environmental management plan.	Information is predominantly presented in concise form with consistent terminology. It does not contain logical links between sections in that issues identified are not translated into environmental management measures representing the essence of a draft environmental management plan.	3
7.2i	2	Allocation of prominence and emphasis to severe adverse impacts, benefits and controversial issues is not apparent. For example, emissions and its potential impact on public health are allocated a low negative significance and no mitigating measures are proposed. However, this assumption is not supported by trial emission tests and is therefore contestable.	Allocation of prominence and emphasis to severe adverse impacts, benefits and controversial issues is not apparent. For example, emissions and its potential impact on public health are allocated a low negative significance and no mitigating measures are proposed. However, this assumption is not supported by trial emission tests and is therefore contestable.	2
7.2j	2	Although the reliability of information included in terms of established professional & disciplinary standards cannot be commented on, most studies appear not to be suitable or sufficient on its own to inform decision-making.	Although the reliability of information included in terms of established professional & disciplinary standards cannot be commented on, most studies appear not to be suitable or sufficient on its own to inform decision-making.	2
7.2k	2	Technical studies are not rigorously applied consistent with nature & complexity of issues (for example no technical studies on existing air quality & trial tests on emissions.	Technical studies are not rigorously applied consistent with nature & complexity of issues (for example no technical studies on existing air quality & trial tests on emissions.	2

7.2l	2	The report conforms in broad terms to relevant EIA guidelines as well as ECA and NEMA guidelines. At the same time certain omissions in terms of this legislation are detected of which the following serve as examples: Reference to cumulative effects and its alternatives; A report on gaps in knowledge, the adequacy of predictive measures and uncertainties encountered; An investigation of arrangements for monitoring and management of impacts.	The report conforms in broad terms to relevant EIA guidelines as well as ECA and NEMA guidelines. At the same time certain omissions in terms of this legislation are detected of which the following serve as examples: Reference to cumulative effects and its alternatives; A report on gaps in knowledge, the adequacy of predictive measures and uncertainties encountered; An investigation of arrangements for monitoring and management of impacts.	2
7.2m	2	Definitions of technical terms, acronyms and initials are not provided.	Definitions of technical terms, acronyms and initials are not provided.	2
7.2n	2	The objectivity of information could not in all instances be confirmed. This is the case because of statements such as that risks associated with the proposed incinerator will be acceptable without any trial tests having been done.	The objectivity of information could not in all instances be confirmed. This is the case because of statements such as that risks associated with the proposed incinerator will be acceptable without any trial tests having been done.	2
7.2o	2	Information does not possess a high level of defensibility in terms of the risk and impact qualification as opposed to proposal uncertainties.	Information does not possess a high level of defensibility in terms of the risk and impact qualification as opposed to proposal uncertainties.	2
7.2p	2	The underlying presence of "cradle to grave" principles as referred to in WPEMP could not be clearly discerned since for example no reference is made to a decommissioning phase.	The underlying presence of "cradle to grave" principles as referred to in WPEMP could not be clearly discerned since for example no reference is made to a decommissioning phase.	2
7.2q	3	The report was made available for public review and expert comment (also refer to WPEMP). Certain concerns were raised afterwards on adequate notification to I&AP.	The report was made available for public review and expert comment (also refer to WPEMP). An initial period of two weeks during December was allowed for comments.	3
7.3a	1	There is no indication of gaps in the required data and explanations of means to deal with it.	There is no indication of gaps in the required data and explanations of means to deal with it.	1
7.3b	1	There is no acknowledgement of difficulties in assembling or analysing the data needed to predict impacts.	There is no acknowledgement of difficulties in assembling or analysing the data needed to predict impacts.	1
8a	4	The South African EIA system contains clear legal provisions including the allocation of functions.		4
8b	4	The South African EIA system also includes an explicit requirement to cover all environmentally.		4
8c	4	The South African EIA system provides clarity on the respective roles and responsibilities of all role players.		4
8d	4	The South African EIA system requires the submission of significant proposals.		4
8e	4	The South African EIA system warrants the inclusion of a broad definition of environmental / coverage factors.		4
8f	4	The South African EIA system makes provision for opportunities for public involvement throughout the process.		4
8g	4	The South African EIA system makes provision for procedures for independent, expert review of scoping reports and EIR's.		4
8h	4	The South African EIA system provides guidance on applying procedures and proposal specific terms of reference.		4
8i	4	The South African EIA system requires agreed timelines for completion.		4

8j	4	The South African EIA system provides visible linkage to decision-making (e.g. approval, permitting etc. based on submission of report). In the instance of the two case studies the content of the respective scoping reports led to a request to do a full environmental impact assessment.	4
8k	4	The South African EIA system specifies the terms and conditions of implementation (refer to applicable ROD's).	4
8l	4	The South African EIA system provides for follow-up / monitoring.	4
8m	4	The South African EIA system provides for the enforcement of provisions.	4