An appraisal of the quality of Waste Management Environmental Impact Assessment (EIA) Reports in South Africa

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Abstract

In recent years, a growing interest in determining the quality of Environmental Impact Assessment (EIA) Reports emanating from the EIA Process has been observed. To date no studies have been done to determine the quality of EIA Reports (which document the aspects and likely consequences of Waste Management Activities) which have been prepared in support of a Waste Management License Applications. It is therefore the purpose of this study to fill this knowledge gap and to provide a benchmark for subsequent Waste Management specific EIA Reports.

This study is therefore aimed at determining the quality of Environmental Impact Assessment (EIA) Reports in South Africa which have been prepared in support of Waste Management License Applications (WMLAs). An amended version of the Lee Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999) was adopted to selected case studies. The Lee Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999) was amended to align the information requirements presented in the Review Checklist with the aims of the study and information requirements which are stipulated in the National Environmental Management Act (107 of 1998) EIA Regulations 2010 and 2014 (Government Notice 984) as well as the National Environmental Management Waste Act (59 of 2008).

The results of this study revealed that EIA Reports which are prepared in support of WMLAs are of a Satisfactory Quality. This in turn suggests that although WMLA EIA Reports in South Africa are not deemed as unsatisfactory, there is most certainly room for improvement. Based on the key findings of the study several recommendations are made to bring Waste Management in South Africa on par with both best practice standards and legal requirements.

Key Words: Waste Management License Applications; Environmental Impact Assessment; Environmental Impact Assessment Report; South Africa; Report Quality; Review Package

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LIST OF ACRONYMS

Acronym	Description
ACW	Asbestos Containing Waste
CA	Competent Authority
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act (73 of 1989)
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMPr	Environmental Management Programme
GNR	Government Notice Regulation
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
MPRDA	Mineral and Petroleum Resources Development Act (28 of 2002)
NEMA	National Environmental Management Act (107 of 1998) as amended
NEMWA	National Environmental Management Waste Act (59 of 2008) as amended
NWMS	National Waste Management Strategy
PPP	Public Participation Process
S&EIR	Scoping and Environmental Impact Reporting
SAWIC	South African Waste Information Centre
SEMA	Specific Environmental Management Act
SWWTW	Southern Waste Water Treatment Works
UCG	Underground Coal Gasification
UK	United Kingdom
WMAs	Waste Management Activities
WMLA	Waste Management License Application
WPIPWM	White Paper on Integration Pollution Waste Management

1 INTRODUCTION

1.1 Introduction

A growing interest in Environmental Impact Assessment (EIA) Report quality has been observed. This growing interest in EIA Report quality is supported by Hansen and Wood (2016:1) who acknowledges the widespread recognition of the necessity to consider EIA effectiveness with regard to practice. Several studies aimed at determining the quality of EIA Report for various industries have been carried out, such as the study done by Anifowosea *et* al. (2016:570) to determine the quality of EIA Reports for both onshore and offshore oil and gas projects. Likewise numerous countries such as Egypt (Badr *et al*., 2011) as well as Portugal and Spain (Canelas *et* al., 2005), to name but a few, has embarked on determining the quality of EIA Reports emanating from their respective EIA Systems.

It can be argued that the United States of America has to a certain extent taken the lead in this regard. Following the enactment of the National Environmental Policy Act (1969), it was required that all Draft Environmental Statements (i.e. EIA Reports) be rated to determine both the adequacy of the information presented and whether the impact of the preferred alternative on the environment has been addressed adequately (Tzoumis, 2007:26).

Although not all countries adopted the Lee and Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999) the overarching objective remains the same that is to determine the effectiveness of the EIA Process by laying emphasis on the quality of Environmental Impact Assessment Reports. Barker and Wood as well as Modak and Biswas (cited by Kabir and Momtaz, 2012:94), propose that the results of these types of provide an indication of the general performance of the EIA process. The relationship between the EIA Process and the EIA reports which stems from the process remains a constant theme in studies such as that done by Morrison-Saunders *et al*. (2001) which focusses on the practitioner's (i.e. Environmental Assessment Practitioner) perspectives on what influences EIA Report quality. The relationship

between report quality and the efficacy of the EIA system is furthermore suggested by Badr *et al*. (2011:279) who indicated that to determine the performance of the Egyptian EIA system, it was necessary to firstly determine the quality of Environmental Impact Statements (EISs), thereby simultaneously developing a yardstick by which to measure the progression (or regression) of the system.

A study done by Pölönen (2006:488) which focused on the challenges concerning the quality assurance of EISs in Finland and the European Union demonstrated the relationship between the quality of EIA Reports and Environmental Legislation governing the EIA Process. The strong reliance on "coordinating authorities (Regional Environment Centres)" to evaluate and determine the adequacy and the quality of the EISs (i.e. Environmental Impact Assessment Report) (Pölönen, 2006:488) and the limited provision made in the Finish Environmental Legislation to challenge the decision taken by the Competent Authority (CA) was also evident by the findings of the study. This observation made suggests that both Environmental Assessment Practitioners (EAPs) and Authorities alike play a role in the effectiveness of the EIA system whether it be preparing the EIA Reports or deciding on the quality of such reports.

It is generally thought that progressive legislation and the consequential improved / amended regulatory framework will result in an improved outcome or product. A study done by Sandham *et al*. (2013[a]:156) to determine whether enhanced regulation resulted in improved EIA Report quality in South Africa revealed that the amendments which were made to the EIA Regulations did in fact not bring about EIA Reports of better quality (Sandham *et al*., 2013[a]:161).

Studies have also been done to determine the quality of industry specific EIA Reports, such as the quality of EIA Reports that were prepared for explosive industry projects in South Africa (Van Der Vyver, 2008:4) and the South African mining industry (Sandham *et al*., 2008[b]:701; Hoffmann, 2007:3). By determining the quality of EIA Reports whether it be industry specific or

the quality of EIA Reports for various project types, it allows for establishing a baseline of EIA Report quality (Van Der Vyver, 2008:3), thereby also allowing for comparative analysis against progressive / progressing legislation. Taking the aforementioned into account the growing interest in the effectiveness of EIA, in particular with regards to the quality of the report emanating from the EIA Process (Sandham *et al*., 2008[b]:701) is evident.

1.2 Background to the study

Since the entrenchment of EIA in the United States' National Environmental Policy Act (1969) many countries have followed suit by developing their own EIA regime (Canter, cited by Barker and Wood, 1999:387) in an attempt to foster Environmental Management in their respective countries. Within a South African context, EIA commenced as a non-mandatory exercise during the 1970s (Sandham *et al*., 2013[a]:155) being implemented of own accord as part of Integrated Environmental Management. It is only with the promulgation of the EIA Regulations under the Environment Conservation Act (73 of 1989) (ECA), that conducting EIAs for specific development activities became mandatory. The ECA has since been repealed by the National Environmental Management Act (107 of 1998) and the EIA Regulations thereunder. South Africa has taken it a step further by passing several Specific Environmental Management Acts (SEMAs) each of which deals with a specific environmental medium, including the National Environmental Management Waste Act (59 of 2008) (NEMWA).

The promulgation of the various SEMAs is intended to strengthen the environmental framework law (UP, 2010:5). Each of the SEMA's therefore has to be aligned with the National Environmental Management Principles that are defined in Chapter 1 of the National Environmental Management Act 107 of 1998. The University of Pretoria also maintain that "South African Environmental law has seen numerous positive contributions through both the revision of, and amendments to, laws regulating diverse thematic areas such as conservation, pollution, mining and water management" (UP, 2010:5).

The progressive nature of South Africa's EIA Regime is evident by the numerous iterations of the EIA Regulations and amendments made to the National Environmental Management Act (107 of 1998). According to Sandham *et al*. (2013[a]:155) the amendments made to the South African EIA Regulations in 2006 were intended to improve EIA effectiveness.

With the promulgation of the NEMWA, South Africa has taken a clear stance towards achieving improved waste management and putting in place the tools that are required to do so. Following the promulgation and coming into effect of the NEMWA there have been numerous amendments made to the Act. Similarly, the List of Waste Management Activities has been amended twice since coming into effect in 2008, with the addition and removal of certain Waste Management Activities. It could be argued that the amendments made to the NEMWA and the Regulations thereunder were fundamentally driven by South Africa's fragmented environmental legislation as well as the need to refine the definition of waste.

Furthermore, provision is made in the NEMWA for assigning Waste Management Officers who are tasked to "coordinate waste management at each level of government" (DEA, 2011:59). The role of the Waste Management Officers therefore includes "addressing the historical fragmentation of waste management functions within government by ensuring that a dedicated authority in each sphere of government is responsible for implementing the policy and regulations of the Waste Act" (DEA, 2011:59).

Prior to the publications of the List of Waste Management Activities published in Government Notice 921 (Government gazette 37083), such activities fell within the ambit of the National Environmental Management Act (107 of 1998) (NEMA) EIA Regulations, except for waste associated with mining activities which were governed under the Mineral and Petroleum Resources Development Act (28 of 2002) (MPRDA). The exclusion of the mining related waste from the NEMWA was further confirmation of the fragmentary nature of environmental legislation pertaining to waste management. Regardless of the overarching Acts under which EIAs are carried out, the basic principles of EIA remain the same, in that the environmental

consequences which may result from an activity are determined, assessed and appropriately mitigated. Furthermore, since the introduction of EIA in South Africa under the ECA, it is believed EAPs and Licensing / Competent Authorities alike have acquired sufficient knowledge that will enable progressive improved quality industry specific EIA Reports regardless of the industry or project type.

Following the promulgation of the NEMWA and the Regulations thereunder, there has been a dynamic shift with regards to the approach towards and regulating waste management in South Africa. The approach towards Waste Management is clearly defined and set out in the NEMWA. It could be expected that the dynamic shift in waste management in South Africa, would result in steep learning curve for EAPs and the Licensing / Competent Authority. It has been observed that Licensing / Competent Authorities are often reluctant to issue Waste Management Licenses for complex projects. Onus can however be placed on the EAPs to prepare EIA Reports which provide adequate information concerning the planned waste management activity/ies.

1.3 Problem Statement

The focus of this study is placed on the quality of the EIA Reports which emanate from the Waste Management License Application Process. As indicated studies have been carried out to determine the quality of EIA Report within the context of specific industries such as the mining industry (Sandham *et al*., 2008[b]:702) and explosives industry (Van Der Vyver, 2008:3). However, to date no studies have been done to determine the quality of EIA Reports (which document the aspects and likely consequences of Waste Management Activities) which have been prepared in support of a Waste Management License Applications. It is therefore the purpose of this study to fill this knowledge gap and to provide a benchmark for subsequent Waste Management specific EIA Reports.

To date very little research has been done on the effectiveness of the NEMWA and the Regulations thereunder to realising what the implementation of the Act is set to achieve. It is

therefore unknown whether South Africa's long standing EIA Practice across various activities and projects have catalysed better EIA Reports for Waste Management License Applications. Given the limited amount of research conducted on the quality of EIA Reports which have been prepared in support of Waste Management License Application in South Africa it is clear that an appropriate EIA review package is required to assist in the assessment of the aforesaid reports in South Africa, and this is a gap that needs to addressed. For this reason, the objective of this study is to investigate the quality of a sample of EIA Reports which have been prepared in support of Waste Management License Application in South Africa. Considering the extensive use and utility of the Lee and Colley review package, it was deemed as an appropriate basis for the development of a review package to assess the quality of the EIA Reports which have been prepared in support of Waste Management License Application in South Africa.

1.4 Research Objectives

The intent of this study can be summarised into the following three overarching research objectives:

1. To evaluate the quality of EIA Reports that have been prepared in support of Waste Management License Applications;
2. To establish a baseline against which to measure the quality of subsequent EIA Reports that are prepared in support of Waste Management License Applications; and
3. To determine common areas of both strengths and weaknesses in terms of the quality of the EIA Reports.

1.5 Structure of dissertation

In keeping with the requirements of the North-West University (NWU), this dissertation has been structured to align with the relevant provisions provided in the NWU's Manual for Postgraduate Studies 2010. The information that is provided in the chapters comprising this dissertation is

intended to systematically build on the information provided in the introductory chapter, whilst the intent of the study (i.e. aims and objectives) remains as a "*golden thread*" in the subsequent chapters.

As a means of gaining a holistic perspective of the study, each of the chapters has been arranged in such a manner that information is tiered to ultimately demonstrate the logical approach that was adopted to achieve the objectives of the study. Taking the aforementioned into account the dissertation comprises of the following chapters:

- Chapter 1 serves to provide a thorough account of the background to the study (Chapter 1.1) and necessity of the information that will be generated by the study (Chapter 1.2). To achieve this the origin of EIA is explained as well as the various advances that have been made to strengthen South Africa's EIA regime. Notwithstanding the South Africa's progressive EIA regime, the information provided furthermore serves to provide the rationale for the study and forms the basis for all subsequent chapters by providing the Problem Statement (Chapter 1.3) and overarching objectives of the study (Chapter 1.4).
- Chapter 2 provides a summary of existing literature specifically related to research that has been done on the quality of Environmental Impact Reports as well as the status of Waste Management and the regulation of waste within a South African context.
- Chapter 3 describes the methodology that was adopted to achieve the research objectives
- Chapter 4 provides a detailed account of the performance of each individual EIA Report included in the review sample in relation to the criteria provided in the Review Package;
- Chapter 5 provides a cross case analysis of the trends in strengths and weaknesses across the different reports.
- A brief overview of the key findings of the study concerning the aims and objectives provided in Chapter 1 is discussed in Chapter 6 of the dissertation to demonstrate that the set research objectives have been achieved.

2 LITERATURE REVIEW

This chapter reflects on existing research that has been done on the quality of Environmental Impact Assessment Reports as well as the status of Waste Management and the regulation of waste within a South African context. An historical perspective of EIA with specific reference to realising what EIA is set to achieve is also provided in relation to existing literature.

2.1 Historical perspective of Environmental Impact Assessment

The notion of EIA stems from the United States' National Environmental Policy Act (of 1969). According to Glasson *et al.* (2012:31) the National Environmental Policy Act (of 1969) (NEPA) was the first piece of legislation to require EIA. Developed countries such as the Commonwealth of Australia announcing its EIA policy in 1972 (Sandham *et al*., 2005[c]:51) followed by developing legislation which would enable EIA in their respective countries. In South Africa EIA as a mandatory legislative requirement however only came about in 1997 with the promulgation of the EIA Regulations in terms of the ECA.

According to Barnard (cited by Lindeque, 2003:39) the ECA contained principles and procedures for Environmental Management, measures for nature conservation, for pollution control and for waste management. The implementation of EIA in South Africa therefore had a rather delayed start, taking into account that legislation creating an enabling environment for EIA in SA was put in place more than two decades after the coming into effect of the NEPA. According to Leu *et al*. (cited by Sandham *et al*., 2005[c]:51) EIA came about much later in developing countries, following the enactment of the NEPA.

Several activities which may have a substantial detrimental effect on the environment were identified and listed in Government Notice R.1182 in Government Gazette 18261 of 5 September 1997. As explained by Sandham *et al.* (2008[b]:701) in 1998 the ECA was partially repealed in favour of the National Environmental Management Act 107 of 1998 with

only a few sections, including Sections 21, 22 and Section 26, together with the regulations promulgated in 1997, remaining in force. These remaining provisions of the ECA and the regulations were completely repealed and replaced by the 2006 NEMA EIA Regulations, which Sandham *et al.* (2008[b]:701) describe as a lengthy revision process.

Provision was made in the aforesaid regulations for infrastructure requirements related to the disposal and storage of waste. Notably and explicitly the disposal of domestic waste was not provided for. Similar and rather restricted provision was made for waste management in the subsequent NEMA Listing Notices (Government Notice R.386 and R.387) which were published on 21 April 2006. Significant progress towards a more diligent approach to managing Waste Management Activities however transpired subsequent to the enactment of the National Environmental Management Waste Act 59 of 2008 (NEMWA) and consequent List of Waste Management Activities (Government Notice No. R.718 of 03 July 2009). Amendments aimed at averting duplication between the NEMA Listed Activities and those listed in Government Notice R.718 were made to the NEMA Listing Notices (Government Notice R.386 and R.387). These amendments continued with the publication of the Government Notice No. R.921 (List of Waste Management Activities) which repealed Government Notice R.718, where several Waste Management Activities previously listed in Government Notice No. R.718 were not listed in Government Notice No. R.921 but rather included in the NEMA EIA Listing Notices. Moreover, the storage, including the temporary storage of general and hazardous waste, other than the storage in lagoons which were previously listed in Government Notice No. R.718 were repealed and replaced with Norms and Standards in Category C of Government Notice No. R.921.

More recently with the coming into effect of the One Environmental System, amendments were made to the List of Waste Management Activities that have, or are likely to have, a detrimental effect on the environment make provision for and include residue stockpiles or residue deposits. Residue stockpiles and deposits previously fell within the ambit of the Mineral and Petroleum Resources Development Act 28 of 2002. The amendment and

inclusion of the residue stockpiles or residue deposits under the NEMWA List of Waste Management Activities is indicative of the centralisation of all waste management and related activities to fall under the auspices of the NEMWA and the Regulations thereunder.

2.2 Environmental Impact Assessment Report Quality

It can be argued that the relationship between the quality of an EIA Report and the eventual management of the impacts which emanate from the proposed activities places a responsibility on EAPs to continuously improve the substance of such reports. Likewise, the continuous improvement of EIA Report quality can only take place once mistakes or areas for improvement, identified by research done on the subject, have been determined. One should also bear in mind that the EIA Report is a product of a preceding system or process. The process and the information which comes from this process ultimately culminate in the EIA Report. In a guideline published by the Department of Environmental Affairs which is intended to serve as a "*reference text on the reporting of environmental impacts addressed*" (Department of Environmental Affairs, 2004:4), it is stated that the "*soundness of an EIR relies heavily on the adequacy of the EIA process*" (Department of Environmental Affairs, 2004:2). Taking the aforementioned into account one can then also argue that when determining the quality of an EIA Report, the soundness of the country's legislative EIA Process should be assed as well in relation to internationally accepted best practice.

When research is done to determine the quality of an EIA Report, it should be viewed as a vehicle for continuous improvement of EIA Report quality. A structured approach is therefore required, considering all factors which have a bearing on the EIA Report, as a product of the EIA Process. Since the dawn of the EIA era a great deal of research which focusses on the quality of EIA Reports has been done. More recently a new avenue of EIA Quality research has raised, namely research which focusses on industry specific or rather EIA which are prepared for a specific activity. Numerous studies on EIA Report quality have been done both locally (South Africa) (Sandham *et al*, 2008[b]; Kruger, 2012; Sandham *et al*, 2008[c]) and abroad (Nadeem and Hameed, 2006; Canelas *et al*., 2005). In theory these studies on EIA

Report quality should allow for a wealth of knowledge to be generated, and from which can be drawn from to identify areas which require improvements relating specifically to the information documented in an EIA Report. Furthermore, it can be argued that common trends are apparent in the findings of EIA quality research, where certain aspects of the EIA Reports consistently perform better when subjected to review. According to Mbhele (2009:41) findings on the poor quality of EIA Reports in particular relating to alternatives and mitigation, revealed similar trends to similar studies conducted to determine the quality of EIA Reports in SA. Studies conducted to determine the quality of EIA Reports in SA includes the study done by Sandham and Pretorius (2008:229) and Sandham *et al.* (2005[c]:50) determine the quality of EIA Report quality in the North West Province and Limpopo Province, respectively. This in turn allows for the dawn of era where research is needed to determine whether the areas for improvement in EIA Reports as identified by the current EIA Quality have translated into concrete movements in the EIA field to address these weaknesses.

One aspect of EIA quality which cannot be disregarded is the fundamental role that the Environmental Legislation of each country where an EIA regime has been implemented, plays in the quality of the EIA Report which emanates from the EIA process. Sandham *et al.* (2008[d]:156) argue that sound environmental decision making relies heavily on the quality of the contents of the EIA Report. The Competent Authority therefore only has the information presented by the EAP in the EIA Report at its disposal and on which to base its decision. Presenting inadequate or omitting information which could potentially sway a decision to grant or refuse Environmental Authorisation could potentially result in irrevocable adverse environmental impacts. Morrison- Saunders *et al*. (2001) notes that the expectations of regulators (the way such expectations are conveyed to proponents and practitioners) on EIA Quality is not always aligned with the information that is conveyed by the EAP in the EIA Reports which are submitted.

The two factors which are most likely to have a direct bearing on the quality of EIA Report includes the integration of EIA best practice in the EIA process and the extent to which legislative requirements are met. Sandham *et al.* (2008[d]:160) maintain that Environmental Assessment Practitioners may not always be familiar with what is required for best practice Environmental Impact Assessment Reports. This view is also support by Kolhoff *et al*. (2013:11) who acknowledges the role that Environmental Assessment Practitioners (referred to as Knowledge Actors) play in achieving and developing EIA ambitions set by countries.

As a minimum, EIA Reports must conform to the information requirements as stipulated in the NEMA EIA Regulations. It must however be emphasised that the degree to which the information provided in the EIA Reports may conform to regulatory requirements, whilst providing insufficient information to the decision-making authority on which to base a decision to either grant or refuse Environmental Authorisation. This view is supported by Barker and Jones (2013:33) who maintains that the EIA Process may very well be driven by compliance rather than best practice. Sandham *et al*. (2008[b]:701) maintain that unsatisfactory EIA Reports might invariably lead to ineffectiveness owing to the fact that the information contained in the report serves as the basis for decision making.

2.3 Comparative analysis of Mining and Wetland Specific EIA Report Quality

Although studies have been done in South Africa which focusses on the quality of EIA Reports for specific sectors such as the oil and gas industry (Barker and Jones, 2013) as well as for specific provinces (Mbhele, 2009; Sandham and Pretorius 2008[e]), fewer studies have been done on specific sectors (e.g. mining) as well as specific environmental attributes (e.g. wetlands). Regardless, the findings of such studies may be indicative of the quality of EIA Reports prepared in support of Waste Management License Applications. It is worth noting that Sandham *et al.* (2008[d]:160) found that the areas of greatest weakness included the description of waste types, quantities and disposal, in a similar study conducted by Sandham *et al.* (2008[b]:704) for mining EIA Reports in South Africa, the review category relating to waste was identified as an area of strength. This anomaly could be due to the fact

that each industry / sector requires a Review Package which has been structured according to the specific elements which are fundamental to assessing the sector specific EIA Report quality. This view is supported by Sandham *et al.* (2008[d]:161) who maintain that there is a prerequisite for review packages to be sector-specific. Sandham *et al.* (2008[d]:161) furthermore also maintains that the general methodology is sufficiently generic for wide application, but the criteria at category and sub-category level must be adapted according to the needs of the sector. A study was done by Sandham *et al.* (2008[b]) to reflect on the quality of mining EIA Reports in South Africa. In this study several EIA Reports which were compiled for mining related projects / activities were reviewed. An overview is given is the subsequent sections on the major findings of the study. Similar to the findings made in the aforementioned wetland EIA Report quality study, sub-categories which not thoroughly addressed in Review Area 1 included the estimated duration of the different project phases, means of transporting raw materials to and from the site, and the collection of data for determination of baseline conditions. Furthermore, although several the several of the subcategories display a relatively even distribution of grades ranging from A to F, it was noted that the overall requirements were well covered.

The aforementioned study that was conducted to assess and determine of EIA Report quality specifically for wetland related projects brought to light a number of shortcomings. These shortcomings were mainly identified in Review Area 1 (Description of the development and the environment) and Review Area 2 (Identification and evaluation of key impacts). With regards to Review Area 1 and specifically relating to wetlands information relating to the replacement costs of goods produced by the wetlands as well as an outline of the assessment methods used for determining the wetland functions, values and uses were either poorly attempted or not addressed. More generically however comprehensive information pertaining to the estimated duration of the different phases, number of workers entering the site and their access to the site, likely means of transport, and infrastructure required was absent. The information requirements laid down in Review Area 4

(Communication) were mostly met by the information contained in the EIA Reports sample, making this the best-performed review area. The extent to which alternatives and mitigation measures were addressed was deemed as satisfactory.

For review area 2, although the sub-categories relating to wastes received a grading of 100%, the sub-category dealing with the prediction of impact magnitude was rated as satisfactory. Although the assessment of anticipated impacts forms the crux of EIA, the methods to be employed to conduct the impact assessments was poorly addressed. According to Sandham *et al.* (2008[b]:704) specific weaknesses related to the indication of gaps in data, methods used for determining impact significance and assumptions in compiling data. Lacking emphasis on public consultation was also evident when rating the sub-categories related thereto.

For Review Area 3 approximately a quarter of the reports included in the sampled performed poorly on the sub-categories which deal with alternatives. The extent to which mitigation measures were addressed in the sample faired significantly better, being rated as satisfactory.

For Review Area 4 the sub-category relating to the provision of an executive (non-technical) summary performed the weakest. Nevertheless, the Review Area 4 was the best performed review area, with 95% of the reports included in the sample graded as satisfactory and 60% in the well-performed zone.

2.4 Analysis of Oil and Gas Sector EIA Report Quality

A study was done by Barker and Jones (2013) which considered the performance of EIA Reports in the United Kingdom offshore oil and gas sector. A summary of the most prominent findings of the study is provided below. Overall the findings revealed that a significant number of EIA Reports included in the sample fell short of satisfactory quality as well an inclination for the process to be driven by compliance rather than best practice (Barker and Jones, 2013:31).

2.4.1 Review Area 1 - Description of project and receiving environment

The EIA Reports included in the sample faired particularly well in comparison to the reports included in the Wetland sample, being deemed as satisfactory when assessing against the review criteria. It is worth noting that although the sub-categories concerning wastes, emissions and the receiving environment "*performed particularly well with more than 94% of the ESs graded as satisfactory*" (Barker and Jones, 2013:34) there was a strong reliance on existing data as opposed to collecting new data. For the description of the project, a strong reliance on generic purposes and design was also noted. Consequently, the project descriptions provided were not explicitly project specific.

2.4.2 Review Area 2 - Identification and assessment of key impacts

All categories which dealt with the identification and evaluation of impacts performed satisfactory, with "*satisfactory grades being achieved for more than 70% of the Environmental Statements*" (Barker and Jones, 2013:35). A concern which was raised by the reviewers is that the methods and approaches used for the identification and evaluation of impacts were not always explained in detail. Furthermore, it was also indicated that the impacts which were identified at the scoping stage were not followed through to the subsequent assessment. The distinction between impact magnitude and impact significance had also not been clearly indicated, therefore it had been used interchangeably. A clear relationship between the prediction of impacts and the baseline environment was not always evident (Barker and Jones, 2013:36).

2.4.3 Review Area 3 - Alternatives and mitigation

The Review Area which dealt with alternatives (i.e. Review Area 3) performed the weakest with "*only 59% of the ESs achieving satisfactory grades, and just under one third (29%) being graded as E (not satisfactory) or F (very unsatisfactory)*" (Barker and Jones, 2013:36). According to Barker and Jones (2013:36) alternative locations were not exhaustively considered.

A strong reliance on alternative designs and processes for exploration wells was evident. It was also noted that operators with major experience were less inclined to consider alternatives, and that costs were a key consideration for determining the feasibility of alternatives. It is worth noting that the extent to which mitigation measures were addressed and the "*commitment of operators to implementing these mitigation measures were comparatively better performed with 74% and 77% respectively thereby achieving satisfactory grades*" (Barker and Jones, 2013:36).

2.4.4 Review Area 4 – Communication of results

Remarkably, although Regulators had indicated that the structure and style of the reports was the main strength of Environmental Statements (i.e. EIA Report), adapting a standard 'template' to suit the specific project was considered a key weakness. EAPs may be prone to put in place templates as a means of fast-tracking the writing up of the EIA Reports, without giving due consideration to the specific aspects of the projects that make it distinctive.

With the stringent timelines laid down in the South African NEMA EIA Regulations 2014, more pressure is placed on EAPs to complete the EIA Process within extremely tight time-frames forcing EAPs to generate innovative means to meet such time-frames. This may ultimately result in a similar case where templates are populated without being adjusted according to the project on hand.

Table 2-1: Summary of research results of EIA Report Quality for specific sectors

Summary of performance Area	Sectoral			
	Oil and Gas (Barker and Jones, 2013)	**Mining (Hoffmann, 2007; Sandham *et al*., 2008[b])**	**Wetlands (Sandham *et al.*, 2008[d])**	**Explosives Manufacturing Industry (Sandham *et al.*, 2013[f])**
Description of project and receiving environment	• Strong reliance on existing data as opposed to collecting new data; • Satisfactory performance for addressing waste; and • Strong reliance on generic purposes and design.	• Review category relating to waste was identified as an area of strength.	• Areas of greatest weakness included the description of waste types, quantities and disposal • Poorly attempted or omitted areas included the description of the phases associated with the project life-cycle	• Review area relating to waste was identified as an area of strength.
Identification and assessment of key impacts	• Satisfactory grades scored for more than 70% of the reports; • Impact identification and methodology not always explicitly provided; • Impact significance and magnitude used interchangeably; and • Impacts identified at scoping stage not followed through to succeeding assessment.	• Sub-categories relating to wastes received a grading of 100%; • Impact magnitude addressed satisfactorily; • Methods to be employed to conduct impact assessments poorly addressed; • Lacking public consultation	• Potential impacts were not per project life-cycle phases, but rather presented as a whole • Explicit details of methodology for carrying out scoping were not provided; • Cumulative and secondary impacts were poorly addressed as opposed to direct impacts; • Impact assessment methodology omitted in some reports; • Impacts associated with non-standard operating conditions and impacts as a deviation from the base line were poorly considered in one report.	• Impact prediction and magnitude was poorly addressed. • Extent to which impacts arising from non-standard operating conditions, nature of and predictions of impacts expressed in measurable quantities, was deemed as poorly addressed. • Scoping deemed as best performing category
Alternatives and mitigation	• Weakest performing area; • 59% of the reports graded as satisfactory; • alternative locations not thoroughly considered; and • Strong reliance on alternative designs and processes.	• Mitigation measures addressed satisfactorily • Quarter of reports performed poorly for alternatives	• Mitigation measures were generally adequately addressed	• Methods employed to identify alternatives not adequately addressed. • Mitigation measures were no adequately addressed
Communication of results	• Structure and style of the reports was the main strength	• Provision of an executive (non-technical) summary performed the weakest	• Best-performed review area	• Best performing review are

The required legislative tools in South Africa which sets out the information requirements for EIA Reports as well as international best practice have laid the foundation for assessing EIA Report quality. Determining the quality of EIA Reports for Waste Management Licenses in South Africa cannot be done without considering the legislative framework which governs waste management in South Africa.

2.5 Status of Waste Management and the regulation of waste within a South African context

According to Kotze (2006:75) South Africa's environmental statutes are largely fragmented, owing to the legislative framework comprising of numerous acts which are "silo-based and environmental-media specific". Taking the aforementioned into account it can then be asked whether South Africa's environmental legislation remains to a certain extent fragmented regardless of numerous endeavours to reform the country's environmental governance. Considering that the management of waste was spread across various environmental acts based on the specific mediums of the environment concerned furthermore indicates the fragmentation of environmental legislation. Consequently, and understandably so the need to consolidate the management of waste into a single "easily" implementable act was evident.

The notion of Integrated Waste Management was first formally introduced in the South African Environmental Management arena, in the White Paper on Environmental Management Policy for South Africa (Government Notice No. 749 of 1998). Included in the White Paper on Environmental Management are several strategic goals and supporting objectives with the aim of initiating the process needed "to begin addressing major issues facing environmental management and the sustainable use of resources and for measuring the success of policy implementation" (Ministry of Environmental Affairs and Tourism, 1998:10). The second goal laid down in the White Paper on Environmental Management explicitly makes mention of Integrated Pollution and Waste Management. The goals laid down in the aforesaid White Paper were ultimately translated into the National Environmental Management Act 107 of 1998, which is

regarded as South Africa's framework environmental legislation. Although NEMA as the framework legislation "provides an overarching framework for environmental protection" (Strydom and King, 2009:194) the Act provided rather limited scope for realising integrated pollution and waste management for South Africa. The 1999 National Waste Management Strategy (NWMS) which followed can be regarded as the first integrated strategy intended to address South Africa's waste management challenges". Similar to the principle on which an Environmental Management Programme in EIA is based and which then becomes the living document and ultimately translating management and mitigation measures into an actionable plan, the 1999 NWMS was based on a similar approach whereby regulatory, economic and fiscal instruments must be used to give effect to the overall NWMS.

The National Waste Management Strategy was first introduced in 1999, and subsequently a reviewed version of the NWMS was published in 2000. The NWMS would ultimately be integrated in the NEMWA. Although the overall objective of the 1999 NWMS as defined in the Draft Framework for the NWMS was to ultimately put in place a tool which could be used to achieve reduced waste production and accordingly reducing the impact of waste on the receiving environment, the strategy was intended to achieve the following three goals:

- Develop strategies to realise Integrated Waste Management;
- Translate the aforementioned strategies into actionable plans; and
- To equip the Department of Environmental Affairs and Tourism and the Department of Water Affairs with the required capacity to implement the action plans.

As stated in the Draft Framework for the National Waste Management Strategy, the NEMWA in a sense can be regarded as a "direct achievement of the 1999 NWMS" and is indicative of the lessons learned from the implementation of the NWMS" (Department of Environmental Affairs, 2009:11). It is important to note that South Africa's less than desirable (then) current state of ineffective waste-management and poor regulatory waste controls are acknowledged in the White Paper on Environmental Management (Government Notice No. 749 of 1998). The

consequence associated with the lack of a poor regulatory framework for waste management is also acknowledged, which is providing an environment conducive to allowing waste producers to externalise waste management costs onto the environment and society. According to Kotze (2006:103) the "policy document recognises the unsustainable results of the (then) current fragmented environmental governance regime". Although the need for an act which specifically addresses waste management was hinted at, the White Paper on Integration Pollution Waste Management (WPIPWM) for South Africa, and therefore also the first step the putting in place this much-needed Specific Environmental Act came about two years after the promulgation of the NEMA. The National Environmental Management Waste Act was however only published in 2008, a decade after the NEMA came into effect.

Given South African's largely fragmented environmental legislation concerning waste management specifically the act had to function as a consolidated and integrated piece of legislation across all disciplines of waste management. As laid down in WPIPWM the provisions provided in the eventual act which would have to address the evident legislative gaps and very importantly clearly set out and clarify the roles responsibilities for pollution and waste management. This is not withstanding the fact that South Africa has "extensive environment, pollution and waste management legislation" (Department of Environmental Affairs and Tourism, 2000) is scattered over several departments and institutions.

The question to ask is therefore whether the National Environmental Management Waste has succeeded to provide the tools (albeit provisions provided in the act) needed to address the challenges which had hindered achieving integrated and effective waste management in South Africa. Taking the aforementioned into account it can be said that South Africa has laid down the necessary groundwork and put in place a much needed piece of legislation to pave the way to improved waste management.

Having reflected on the status of Waste Management and the regulation of waste within a South African context as well as the origins and objectives of EIA, it is evident that there is a need to

determine whether EIA Reports prepared in support of Waste Management Licenses are done so in accordance with legislative requirements and internationally accepted best practice.

3 METHODOLOGY

This chapter is intended to provide a comprehensive description of the methodology that was applied to determine the quality of Environmental Impact Assessment (EIA) Reports that have been prepared in support of a Waste Management License Applications. With the intention of building upon the work done by other researches in determining the quality of industry specific EIA Reports, the Lee and Colley Review Package Package (Lee and Colley, 1992; Lee *et al*., 1999) will be applied to the sample.

As the South African EIA practice is unique in its own right, in that the structure of its environmental legislation may differ from those of other countries, the application of the methodology has therefore been structured to align with the elements which are considered fundamental for providing adequate information concerning proposed Waste Management Activities (WMAs). This chapter will provide a detailed account of the following items:

- The Lee and Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999);
- Amendment of the Lee and Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999) for a South African context;
- Conducting a review of the EIA Reports included in the sample using the amended review package;
- Access to data and review sample; and
- Review methodology.

The methodology for this study was selected after careful consideration had been given to work that had already been done relating specifically to EIA Report quality assessment. Although internationally numerous studies (Badr *et.al.*, 2011; Barker & Wood, 1999; Canelas, 2005) intended to determine the quality of EIA Reports have been conducted, limited research which focusses on EIA Reports that had been prepared for specific fields

(Sandham *et.al*., 2008[d]:155). Available studies which aimed to determine EIA Report quality for specific fields was drawn from, such as a study that was done by Sandham *et.al*. (2008[d]:155) which was intended to determine the quality of EIA Reports for projects which have the potential of affecting wetlands in South Africa. In this particular study amendments were made to the Lee and Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999) for the purpose of the study at the subcategory level to include specific wetlands issues (Sandham *et.al*., 2008[d]:156).

Similarly to the methodical approach that was adopted to develop a review package to assess the quality of EIA reports of Local Authority structure and local plans in the United Kingdom (UK), whereby the draft European Union Strategic Environmental Assessment Directive 1999 were the requirements of the Directive was fully reflected in the review package (Simpson, 2001:85), the methodology selected for this study had to be flexible enough to allow for the adaption thereof and alignment with the aim of the study, whilst retaining the general structure and methodological approach.

3.1 The Lee and Colley Review Package

The Lee and Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999) was developed as a pragmatic tool to assist with determining the quality of Environmental Impact Statements (EIS) that had been prepared in accordance with requirements of the UKs Planning Regulations. The aforementioned regulations were amended in March 1999 to make provision for environmental assessments that were to be undertaken in accordance with Directive 85/337/EEC. Accordingly, the Review Areas and therefore also the Review Categories and Sub-Categories that make up the Review Package were initially developed to be specifically tailored to the requirements stipulated in the aforementioned Directive, as these would be considered indicators of the overall quality of the EIS.

Efforts towards assessing and determining the quality of EIA Reports have taken off significantly since the dawn of the Lee and Colley Review Package (Lee and Colley, 1992;

Lee *et al*., 1999) and have been successfully applied in numerous countries such as Egypt (Badr *et al*., 2011), Portugal and Spain (Canelas *et* al., 2005) where an EIA Regime has been established. Furthermore, the Lee and Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999) has also come to be the main methodological approach to report quality review (Sandham *et.al*., 2008[b]:701), as is evident by the extensive research on report quality that have been conducting using the Review Package. This notion is supported by Barker and Jones (2013:33) who maintain that the Lee and Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999) is a reputable manner for the appraisal of the quality of Environmental Statements which is applied universally.

The Review Areas and therefore also the Review Categories and Sub-Categories that make up the Review Package however also encompasses elements which are considered internationally recognised best practice (Barker and Wood, 1999:391). This allows for the global adoption of the Review Package. The review package has been proven to be dynamic in nature in that it can be amended to align with the regulatory requirements of various countries whilst remaining substantially in its original form (Lee and Colley, 1992). This allows for the Review Package to be amended aligning it with the aims of this study whilst retaining the underlying structure thereof.

3.2 Modification of the Review Package

The Review Package takes the form of a hierarchy (refer to Figure 3-1), where the assessment of each review criterion within the lowest tier (Level 1) is required to assess the subsequent levels. The reviewer commences the review at the lowest level (i.e. Level 1) which comprises of simple criteria against which the specific tasks and procedures carried out are assessed. The diligence with which the criteria of Level 1 have been executed are therefore used to determine how well the specific tasks and procedures were carried out.

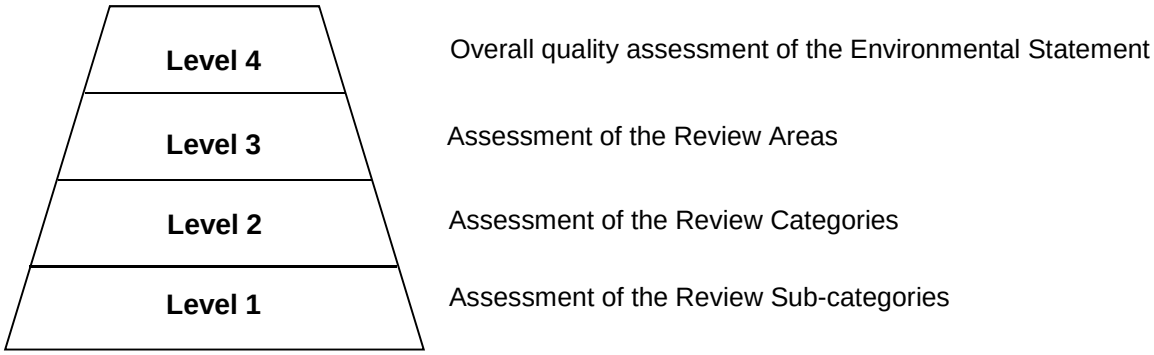

Figure 3-1: The assessment hierarchy

Although the Review Topics of the Review Package are to a certain extent aligned with the information that is to be provided in EIA Reports prepared according to the National Environmental Management Act 107 of 1998 (NEMA) EIA Regulations, it was necessary to alter the Review Topics in order for the following to be achieved:

- Ensure that the requirements stipulated in both the 2010 and 2014 NEMA EIA Regulations were considered, thereby making the Review Package specific to a South African context;
- Build on previous studies done to determine the quality of EIA Report in a South African context; and
- Ensure that the objectives of the NEMWA are taken into account, in particular with regards to the definition of waste as well as the application of the Waste Management Hierarchy.

To ensure that the underlying structure of the assessment pyramid remained unchanged careful consideration was given before amending the Review Package. For the sake of developing a comprehensive review package, preference was given to the addition of review criteria as opposed to removing the criteria provided in the Review Package as developed by Lee and Colley (Lee and Colley, 1992; Lee *et al*., 1999). This would furthermore also assist

in determining whether the EIA Reports contained in the sample are on par with international standards in particular that of the UK. The logical and sequential Process that is followed when conducting a review as well as the information to be provided under each Review Area also provides the opportunity to evaluate the arrangement / presentation / grouping of information in a manner which can assist the decision-making authority and Interested and Affected Parties (I&APs) in locating information relevant to the specific aspect of the project.

For ease of reference a comparison between the Review Topics provided in the Review Package as well as the corresponding minimum information to be provided in EIA Reports as stipulated in both the NEMA EIA Regulations 2010 and NEMA EIA Regulations 2014 are provided in a tabular format (refer to Table 3-1). Where additional information to be included in the EIA Report as required in terms of the NEMA EIA Regulations it is indicated as such in Table 3-1.

3.3 Additional Considerations

Several additional considerations, most of which have not been formally documented or researched, were also reflected on. These considerations included the experience of the EAP, the availability of recognised South African guidelines specific to the waste sector as well as the perception of environmental best practice.

3.4 Experience of Environmental Assessment Practitioner

The experience of the EAP who prepares and EIA Report cannot be disregarded, as the knowledge gained by implementing the EIA Process for various projects over a significant period, can possibly contribute to the ease with which the EAP is able to prepare a report which is specific to an industry without producing a report that is populated with generic information only. Conversely an EAP with little experience in conducting an EIA Process may prepare a report that is largely populated with generic information.

Several studies which were done to determine the quality of EIA Reports alluded to the probable relation between the quality of the report and the experience of the EAP who

prepared the document. In a study conducted by Androulidakis and Karakassis (2006:249) the analysis of the results over a two-year period revealed a percentage-wise variation of the degree of adequacy by which the attributes contained in the review checklist were addressed. It was also found that the adequacy by which the attributes were addressed declined over the two-year period, as opposed to improving quality.

In a study that was done by Badr *et al.* (2011:280) to benchmark the performance of EISs in Egypt, the results suggest that the "*quality of an EIS might be affected, to some extent, by the experience of the consultant(s) who conducted the EIA study*". In view of the fact that the NEMWA and the regulations thereunder have been in effect (*notwithstanding subsequent amendments to the Act*) since 2008 and 2013 respectively, it is expected that EAPs have at best gained an understanding of preparing EIAs which have been tailored to conform to the objectives of the Act. Both the NEMA EIA Regulations 2010 and 2014 explicitly require that the experience of the EAP be included in the EIA Report. Furthermore, the Application for Integrated Environmental Authorisation and Waste Management Licence Form which precedes the submission of the EIA Report to the Competent Authority, specifically require that the EAP's experience with EIAs and the relevant application Processes be included in the Application Form.

Where the proponent is set on merely complying with minimum requirements with the aim of obtaining a Waste Management License in order for the Applicant to proceed with the planned Waste Management Activities as soon as possible, the objectives of the EIA Process may be marginalised. In this regard the Waste Management License EIA Process is therefore reduced to an administrative Process where the EAP then merely becomes the facilitator. The aforementioned will most certainly have an implication on the quality of the EIA Report that is produced. Additional considerations such as completing the work within the shortest possible time based on the awarded tender and budgetary constraints may also have a bearing on the EIA Report quality. These factors are however not the focus of the study, and the additional review category and sub-categories which make reference to the

EAP's experience relating specifically to Waste Management License EIAs are deemed sufficient for the purpose of this research.

3.5 Waste Sector Guidelines

Regardless of environmental best practice EIA Reports must conform to regulatory requirements. Therefore, the revision of the review package was done to merge regulatory requirements whilst retaining the best practice elements contained in the original review package. Environmental Assessment Practitioners are thus required to prepare a report which presents a magnitude of information in an easily understood manner, whilst conforming to regulatory requirements across various acts. This is particularly so when applying for Environmental Authorisation for both NEMA and NEMWA activities in a consolidated Application and subsequently a combined EIA Report.

It should be noted that although a Waste Management License is issued in terms of the NEMWA a Scoping and Environmental Reporting (S&EIR) Process as set out NEMA EIA Regulations must be followed. The EIA Report requirements as set out in the NEMA EIA Regulations are however not specific to Waste Management Activities and as such the objectives of the NEMWA as well as the information to be provided in a Waste Management License have also been taken into account in populating Table 3-1. For the purpose of this study the Review Package was therefore applied with minor changes made to align it with the intent of the study as well as the characteristics of the South African EIA regime.

Table 3-1: Comparative Analysis of review topics and EIA Report Requirements

Review Area	Review Category	Lee and Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999)	Corresponding 2010 NEMA EIA Regulatory Requirement	Corresponding 2014 NEMA EIA Regulatory Requirement	Corresponding NEMWA Requirements	Amendment of Review Topic Required (Yes / No)	Corresponding Sub-Category of modified Review Package
1. Environmental and project description	1.1. Description of the development	1.1.1 Development purpose and objective explained	Regulation 31(2)(f) - A description of the need and desirability of the proposed activity	Appendix 3 – 3(f) motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location	48(a) - The need for, and desirability of, the waste management activity	Yes	1.1.1 - Purpose and objectives of Waste Management Activity/ies
		1.1.2 Description of development size and design	No explicit corresponding requirement	Appendix 3 – 3(h)(i) full description of the Process followed to reach the proposed development footprint within the approved site, including: details of the development footprint alternatives considered;	No explicit corresponding requirement	Yes	1.1.2 - Description of all facility/ies associated with the Waste Management Activity /ies
		1.1.3 Appearance and presence of completed project described	No explicit corresponding requirement	Appendix 3 - (d)(ii) a description of the scope of the proposed activity, including a description of the associated structures and infrastructure related to the development;	No explicit corresponding requirement	No	-
		1.1.4 Description of nature of the production processes and production rate.	No explicit corresponding requirement	No explicit corresponding requirement	No explicit corresponding requirement	Yes	1.1.4 - Visual depiction of planned Waste Management Activity/ies
		1.1.5 Nature and quantities of raw materials needed throughout project life-cycle	No explicit corresponding requirement	No explicit corresponding requirement	No explicit corresponding requirement	No	-
	1.2 Site description	1.2.1 Development footprint and location must be described and mapped respectively	No explicit corresponding requirement	Appendix 3 – (l)(ii) an EIS which contain a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers	51(b) - the premises or area of operation where the waste management activity may take place	Yes	1.2.1 - Extent of waste management activities mapped in relation to environmentally sensitive areas must be mapped
		1.2.2 Description of proposed and existing land uses	No explicit corresponding requirement	No explicit corresponding requirement	No explicit corresponding requirement	No	-
		1.2.3 Duration of each project lifecycle phase defined	No explicit corresponding requirement	No explicit corresponding requirement	No explicit corresponding requirement	No	-
		1.2.4 Provision of estimated number of workers and visitors entering the site	No explicit corresponding requirement	No explicit corresponding requirement	No explicit corresponding requirement	No	-
		1.2.5 Description of transportation and quantities of materials and products	No explicit corresponding requirement	No explicit corresponding requirement	No explicit corresponding requirement	No	-
	1.3 Description of waste types, quantities and disposal.	1.3.1 Estimation of waste and energy quantities	No explicit corresponding requirement	No explicit corresponding requirement	51(h) - the amount and type of waste that may be generated, handled, Processed, stored, reduced, re-used, recycled, recovered or disposed of	Yes	1.3.1 - Description of all waste types to be generated and anticipated waste volumes
		1.3.2 Proposed handling, treatment and disposal of waste must be described	No explicit corresponding requirement	No explicit corresponding requirement	51(i) - any other operating requirements relating to the management of the waste; and	No	-
		1.3.3 Explanation of methods used to determine quantities of residuals and wastes.	No explicit corresponding requirement	No explicit corresponding requirement	No explicit corresponding requirement	No	-
	1.4 Description of receiving environment	1.4.1 Indicate receiving environment on map.	No explicit corresponding requirement	Appendix 3 – 3(c) a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale	No explicit corresponding requirement	No	-
		1.4.2 Environment broadly defined	Regulation 31(2)(d) - A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;	Appendix 3 – 3(h)(iv) a full description of the Process followed to reach the proposed development footprint within the approved site, including: the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	No explicit corresponding requirement	No	-
	1.5 Baseline environmental description	1.5.1 Description of important environmental components.	Regulation 31(2)(d) - A description of the environment that may be affected by the activity and the manner in which the physical, biological, social,	Appendix 3 – 3(h)(iv) a full description of the Process followed to reach the proposed development footprint within the approved site, including: the	No explicit corresponding requirement	No	-

Review Area	Review Category	Lee and Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999)	Corresponding 2010 NEMA EIA Regulatory Requirement	Corresponding 2014 NEMA EIA Regulatory Requirement	Corresponding NEMWA Requirements	Amendment of Review Topic Required (Yes / No)	Corresponding Sub-Category of modified Review Package
			economic and cultural aspects of the environment may be affected by the proposed activity;	environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects			
		1.5.2 Use existing sources of information	No explicit corresponding requirement	No explicit corresponding requirement	No explicit corresponding requirement	No	-
		1.5.3 Reference local land use plans and policies	No explicit corresponding requirement	Appendix 3 – 3(e) a description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;	49(3)(b) - any applicable national environmental management policies and, where the MEC is the licensing authority, any applicable provincial environmental management policies;	Yes	1.5.3 - Local land use plans, policies consulted and other data collected to determine baseline conditions
2. Identification and evaluation of key impacts	2.1 Definition of impacts	2.1.1 Description of all effects emanating from project	Regulation 31(2)(d) - a description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;	Appendix 3 – 3(vi) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community, that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	No explicit corresponding requirement	No	-
		2.1.2 Description of impacts on all environmental elements (i.e. human beings, flora and fauna, soil, water, air, climate, landscape, material assets, cultural heritage)	Regulation 31(2)(d) - a description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;	Appendix 3 – 3(h)(vi) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community, that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	No explicit corresponding requirement	No	-
		2.1.3 Consideration of impacts in case of unlikely event	No explicit corresponding requirement	No explicit corresponding requirement	No explicit corresponding requirement	No	-
		2.1.4 Deviation from baseline environmental conditions regarded as impact	No explicit corresponding requirement	No explicit corresponding requirement	No explicit corresponding requirement	No	-
	2.2 Identification of impacts	2.2.1 Application of Impact Assessment Methodology	Regulation 31(2)(h) - an indication of the methodology used in determining the significance of potential environmental impacts;	Appendix 3 – (h)(i) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	No explicit corresponding requirement	No	-
		2.2.2 Explanation of Impact Assessment Methodology	Regulation 31(2)(h) - an indication of the methodology used in determining the significance of potential environmental impacts;	Appendix 3 – (h)(i) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;	No explicit corresponding requirement	No	-
	2.3 Scoping	2.3.1 Notify all possible I&APs	Regulation 31(2)(e) (iii – iv) a summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments; and copies of any representations and comments received from registered interested and affected parties;	Appendix 3(h)(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 73	No	-
		2.3.2 Engage with public	Regulation 31(e)(iii) - details of the Public Participation Process conducted in terms of sub regulation (1), including – (iii) a summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments;	Appendix 3(h)(ii) details of the public participation Process undertaken in terms of Regulation 41 of the Regulations, including copies of the supporting documents and inputs and (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	No explicit corresponding requirement	No	-
		2.3.3 Significant impacts taken forward	Regulation 31(l) - an assessment of each identified potentially significant impact	3(j) - an assessment of each identified potentially significant impact and risk	No corresponding requirement.	No	-
	2.4 Prediction of impact magnitude	2.4.1 Describe knowledge gaps and limitations. Data sufficient for task.	Regulation 31(m) - a description of any assumptions, uncertainties and gaps in knowledge;	3(p) - a description of any assumptions, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed	No corresponding requirement.	No	-
		2.4.2 Description and	No corresponding requirement.	No corresponding requirement.	No corresponding requirement.	No	-

Review Area	Review Category	Lee and Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999)	Corresponding 2010 NEMA EIA Regulatory Requirement	Corresponding 2014 NEMA EIA Regulatory Requirement	Corresponding NEMWA Requirements	Amendment of Review Topic Required (Yes / No)	Corresponding Sub-Category of modified Review Package
		appropriateness of impact assessment methodology.					
		2.4.3 Quantify impact predictions	No corresponding requirement.	No corresponding requirement.	No corresponding requirement.	No	-
	2.5 Assessment of impact significance	2.5.1 Distinction drawn between significance to community and impact magnitude	No corresponding requirement.	No corresponding requirement.	No corresponding requirement.	No	-
		2.5.2 Assess impact significance	Regulation 31(l) - an assessment of each identified potentially significant impact	3(j) - an assessment of each identified potentially significant impact and risk	No corresponding requirement.	No	-
		2.5.3 Justification of choice of standards, assumptions and value systems	No corresponding requirement.	No corresponding requirement.	No corresponding requirement.	No	-
3. Alternatives and Mitigation	3.1 Alternatives	3.1.1 Consideration of alternative project sites	Regulation 31(g) - description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity	3(g) – a motivation for the preferred development footprint within the approved site 3(h)(i) - a full description of the Process followed to reach the proposed development footprint within the approved site, including (i) details of the development footprint alternatives considered;	Section 48(a) Alternatives considered, including similar waste management activities	No	-
		3.1.3 Consideration of design, Process and operational alternatives	This aspect is addressed in the definition of alternatives as described in the regulations.	This aspect is addressed in the definition of alternatives as described in the regulations.	-	No	-
		3.1.3 Where acceptable mitigation cannot be achieved, reconsider previously rejected alternatives	No corresponding requirement	No corresponding requirement	No corresponding requirement	No	-
	3.2 Mitigation	3.2.1 All impacts must be mitigated	Regulation 31(l)(vii) - an assessment of each identified potentially significant impact, including (vii) the degree to which the impact can be mitigated	3(viii) - the possible mitigation measures that could be applied and level of residual risk; 3(vcc) - the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts (cc) an be avoided, managed or mitigated	Section 48(c) -When considering an application for a waste management licence, the licensing authority must take into account all relevant matters, including (c) the best practicable environmental options available and alternatives that could be taken (i) lo prevent, control, abate or mitigate pollution;	No	-
		3.2.2 Project modification, compensation, alternatives and pollution control to be considered as mitigation.	No explicit corresponding requirement, when considering the definition of mitigation as stipulated in the regulations.	No explicit corresponding requirement, when considering the definition of mitigation as stipulated in the regulations.	Section 48(a) Alternatives considered, including similar waste management activities	No	-
		3.2.3 Effectiveness of mitigation	No corresponding requirements.	No corresponding requirements.	No corresponding requirements.	No	-
	3.3 Commitment to mitigation	3.3.1 Demonstration of commitment to mitigation measures	No corresponding requirements.	No corresponding requirements.	Section 59 - a licensing authority must take into account all relevant facts, including whether (d) that person has the ability to comply with this Act and any conditions subject to which the application may be granted:	No	-
		3.3.2 Monitoring and follow-up	No corresponding requirements.	No corresponding requirements.	Section 51(k) monitoring, auditing and reporting requirements.	No	-
4. Communication of results	4.1 Report Structure	4.1.1 Project Description	Regulation 31(2)(b) - a detailed description of the proposed activity	3(d) a description of the scope of the proposed activity, including (i) all listed and specified activities triggered and being applied for; and (ii) a description of the associated structures and infrastructure related to the development;	No corresponding requirement	Yes	4.1.1 - Briefly describing the project activities associated with Waste Management Activity /ies The aims of the environmental assessment How aims are to be achieved
		4.1.2 Sensible report structure	No corresponding requirement	No corresponding requirement	No corresponding requirement	No	-
		4.1.3 Chapter summaries	No corresponding requirement	No corresponding requirement	No corresponding requirement	No	-
		4.1.4 Referencing and Citation	No corresponding requirement	No corresponding requirement	No corresponding requirement	No	-
	4.2 Presentation of information	4.2.1 Information to be presented in an easily understandable manner	No corresponding requirement	No corresponding requirement	No corresponding requirement	No	-
		4.2.2 Technical terms, acronyms and initials should be defined	No corresponding requirement	No corresponding requirement	No corresponding requirement	No	-

Review Area	Review Category	Lee and Colley Review Package (Lee and Colley, 1992; Lee *et al*., 1999)	Corresponding 2010 NEMA EIA Regulatory Requirement	Corresponding 2014 NEMA EIA Regulatory Requirement	Corresponding NEMWA Requirements	Amendment of Review Topic Required (Yes / No)	Corresponding Sub-Category of modified Review Package
		4.2.3 Presented as an integrated whole	No corresponding requirement	No corresponding requirement	No corresponding requirement	No	-
	4.3 Highlighting key considerations	4.3.1 Laying emphasis on anticipated positive and high significance impacts	Regulation 31(2)(o)(ii) - (o) an environmental impact statement which contains (ii) a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives;	3(l)(i) - an environmental impact statement which contains (i) a summary of the key findings of the environmental impact assessment	No corresponding requirement	No	-
		4.3.2 Information conveyed without bias	No corresponding requirement	Regulation 13(1)(d) - perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the application	No corresponding requirement	No	-
	4.4 Non-technical summary	4.4.1 Non-technical summary	Regulation31(2)(o) - an environmental impact statement which contains - (i) a summary of the key findings of the environmental impact assessment; and (ii) a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives;	3(x) - a concluding statement indicating the preferred alternative development location within the approved site 3 (n) - an environmental impact statement which contains a (i) a summary of the key findings of the environmental impact assessment (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	No corresponding requirement	No	-
		4.4.2 Summary which incorporates all aspects	Regulation 31(2)(o) - an environmental impact statement which contains - (i) a summary of the key findings of the environmental impact assessment; and (ii) a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives;	3 (n) - an environmental impact statement which contains a (i) a summary of the key findings of the environmental impact assessment (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	No corresponding requirement	No	-

3.6 Conducting the review

The review commences at the lowest level of review pyramid. The criteria according to which the report is reviewed becomes less prescriptive with each progressing level, in that the criteria described in the lowermost level (i.e. Level 1) relate to specific tasks and procedures to be performed, whilst the subsequent levels (i.e. Level 2 and Level 3) are assessed by taking into account the evaluations of the sub-categories (Kruger, 2012:31). The scores (i.e. symbols) are recorded for each of the Review Categories are then used to assess the Review Area. It is therefore fundamental that the assessment of each of the criteria contained in the Sub-Categories be conducted meticulously, as it will determine the review of each subsequent level and ultimately the report as a whole. After each of the Review Areas have been assessed the report as a whole can be assigned an assessment symbol.

Assessment symbols rather than numbers are assigned, to reflect how well the tasks relating to the Sub-category are performed (refer to Table 3-2). The subtraction and addition of scores are eliminated by the adoption of an approach which uses symbols to assess the tasks, as the former may result in misleading results (Simpson, 2001:87). Furthermore, the guidelines for conducting a review prescribed by Lee *et.al.* (1999:29) cautions reviewers against reducing the assessment of the Category from averaging of the assessments of the component Sub-categories.

Table 3-2: Description of assessment symbols

Symbol	Description
A	Relevant tasks well performed, no important tasks left incomplete.
B	Generally satisfactory and complete, only minor omissions and inadequacies.
C	Can be considered just satisfactory despite omissions and/or inadequacies.
D	Parts are well attempted but must, as a whole, be considered just unsatisfactory because of omissions or inadequacies.
E	Not satisfactory, significant omissions or inadequacies.
F	Very unsatisfactory, important task(s) poorly done or not attempted.
N/A	Not applicable. The Review Topic is not applicable or it is irrelevant in the context of this Statement.

As was explained in Section 3.2 it was necessary to modify the evaluation criteria to include the applicable South African legislative provisions as well waste management aspects. The abbreviated EIA Report review criteria are provided in Table 3-3. The complete review package applied to this study is provided in Appendix A. The review of each report is concluded by providing a brief summary of general observations and remarks regarding the report quality as well as a description of the extent to which the report conforms to legislative minimum requirements.

Table 3-3: Abbreviated EIA Report review criteria

1. Description of the development

1.1 Description of the development

1.1.1 Purpose and objectives of Waste Management Activity/ies

1.1.2 Design and size of development

1.1.3 Physical presence and appearance of completed development within receiving environment

1.1.4 Visual depiction of planned Waste Management Activity/ies

1.1.5 Nature and quantity of raw materials needed during different phases

1.1.6 Waste Management Hierarchy

1.1.7 Identification of applicant

1.1.8 Details of EAP

1.2 Site Description

1.2.1 Footprint of Waste Management Activity/ies

1.2.2 Description of demarcation of Land use areas

1.2.3 Estimated duration of different phases

1.2.4 Estimated number of workers and/or visitors entering development site, access to site and likely means of transport

1.2.5 Means of transporting raw materials/products to and from site and approximate quantities involved

1.3 Description of waste

1.3.1 Description of all waste types to be generated and anticipated waste volumes

1.3.2 Proposed handling/treatment, disposal and disposal routes to the environment

1.3.3 Methods of obtaining quantity of residuals and wastes

1.4 Environment Description

1.4.1 Indication of likely area to be affected by development

1.4.2 Greater area to accommodate potentially significant effects occurring away from immediate affected environment

1.5 Baseline Conditions

1.5.1 Identification and description of important

2.4 Prediction of Impact Magnitude

2.4.1. Data used to estimate magnitude of main impacts and gaps in data clearly indicated

2.4.2. Methods predicting impact magnitude clearly described

2.4.4. Express predictions of impact in measurable quantities with confidence limits

2.5 Assessment of Impact Significance

2.5.1 Description of significance of impacts

2.5.2 Significance of impacts in terms of national and international quality standards

2.5.3 Justification of proposed method of assessing significance

3. Alternatives and mitigation

3.1 Alternatives

3.1.1 Consideration/description of alternative sites

3.1.2 Consideration/description of alternative processes, designs and operating conditions

3.1.3 For unexpectedly severe adverse impacts identified

3.1.4 Comparative assessment of all alternatives identified

3.2 Scope and effectiveness of mitigation measures

3.2.1 Consider mitigation of all significant adverse impacts

3.2.2 Mitigation measures considered

3.2.3 Extent of effectiveness of mitigation

3.3 Commitment to mitigation

3.3.1 Clear record of commitment

3.3.2 Monitoring arrangements should be proposed in draft EMP

4. Communication of results

4.1 Layout of the report

4.1.1 Introduction

4.1.2 Best Practicable Environmental

			components of the affected environment		
		1.5.2	Existing data sources searched and utilized		
		1.5.3	Local land use plans, policies consulted and other data collected to determine baseline conditions		
2.	**Identification and evaluation of key impacts**				
	2.1	*Definition of impacts*			
		2.1.1	Description of all possible effects of project on environment		
		2.1.2	Identify and describe the effects and interaction of effects on environment		
		2.1.3	Impacts arising from non-standard operating conditions		
		2.1.4	Impacts arising from deviation from Baseline conditions		
	2.2	*Identification of impacts*			
		2.2.1	Impact identification methodology		
		2.2.2	Description of impacts identification methods		
	2.3	*Scoping*			
		2.3.1	Genuine attempt to contact general public and special interest groups to appraise them of project		
		2.3.2	Arrangements to collect opinions and concerns of I&APs		
		2.3.3	Key impacts		
					Option
				4.1.3	Arrangement of information
				4.1.5	Chapter summaries provided
				4.1.6	External sources referenced
				4.2	*Presentation*
				4.2.1	Presentation of Information
				4.2.2	Technical terms, acronyms, initials defined
				4.2.3	Statement presented as an integrated whole
				4.3	*Emphasis*
				4.3.1	Prominence and emphasis to potentially severe impacts
				4.3.2	Statement must be unbiased
				4.3.3	Opinion as to whether the activity should/should not be authorised
				4.4	*Non-Technical Summary*
				4.4.1	Non-technical summary of main findings and conclusions
				4.4.2	Summary must cover all main issues
				4.4.3	EAP Opinion

3.7 Access to data and review sample

The tasks to be carried out as part of public consultation Process during the EIA Process and which are provided in the 2010 and 2014 NEMA EIA Regulations require that all reports be placed in the public domain for review for a specified period. The latter NEMA EIA Regulations, as described in Regulation 23(1)(a), however only stipulate that the EIA Report must have been subjected to a Public Participation Process (PPP) of at least 30 days prior to submission thereof to the Competent Authority (CA) for review and consideration, whereas the 2010 NEMA EIA Regulations merely requires that all registered I&APs must be afforded the opportunity to comment on all written submissions made to the CA. It is worth noting that the 2010 NEMA EIA Regulations makes specific provision for and reference to Waste Management Activities. No reference to Waste Management Activities is however made in the 2014 NEMA EIA Regulations.

Taking the aforementioned into account, all reports which are contained in the sample, were placed in the public domain as part of the legislative Process that was followed. All of the

reports that are included in the review sample was obtained from the various consulting firms' (who conducted the Scoping and Environmental Impact Reporting Process) websites. In the interest of full disclosure, the EAPs who prepared the reports on behalf of the proponents were also informed that their respective reports would form part of this study. In response to concerns raised by the EAPs who had provided copies of the EIA Reports included in the sample, the details of the proponents and project names are not be disclosed in the study.

Given that Section 24L of the NEMA allows for an integrated application to be made in terms of the NEMA and any Specific Environmental Management Act (SEMA), all EIA Reports contained in the sample constitute Applications made in terms of the NEMA EIA Regulations as well as the NEMWA. The amendments that were made to the NEMA in the National Environmental Management Laws Second Amendment Act 30 of 2013 included the revision of the definition of a SEMA to include the NEMWA. In instances where the proposed projects included in the sample triggered activities listed in the NEMA Listing Notices as well as in Schedule 1 of the NEMWA an integrated Scoping and Environmental Impact Reporting process was followed. The EIA Reports were therefore written to provide information on both the NEMA Listed Activities as well as the triggered Waste Management Activities of Schedule 1 of the NEMWA. It was therefore important to extract and consider the information pertaining to only the Waste Management Activities which were provided in the EIA Reports.

A sample of ten (10) EIA Reports (refer to Table 3-4) was randomly selected based on the availability of a complete electronic copy that could be obtained from the internet. The EIA Reports that were included in the review sample are not confined to a specific industry or project type. A detailed account of the results of the review is provided in Chapter 5.

Table 3-4: EIAs included in Review Sample

No.	Project Title	Waste Management License Granted	NEMA EIA Regulatory Regime

No.	Project Title	Waste Management License Granted		NEMA EIA Regulatory Regime
1.	Conversion of quarries to Asbestos Containing Waste Disposal Facility.	Yes	License Number: 12/9/11/L703/8	NEMA EIA Regulations 2010
2.	Underground Coal Gasification Pilot Project and Associated Infrastructure in support of co-firing of gas at the Majuba Power Station, Amersfoort, Mpumalanga	Yes	License Number: 12/9/11/L621/5	NEMA EIA Regulations 2010
3.	Venetia Mine, Limpopo Province	-	No record of a Waste Management License issued for the project could be found on the South African Waste Information Centre (SAWIC).	NEMA EIA Regulations 2010
4.	Amadwala Integrated Management Facility	Yes	License Number: 12/9/11/L1257/3	NEMA EIA Regulations 2010
5.	Waste Management License for Silicon Smelters	Yes	License Number: 12/9/11/L912/6	NEMA EIA Regulations 2010
6.	Matimba Power Station Ash Disposal Facility	-	No record of a Waste Management License issued for the project could be found on the South African Waste Information Centre (SAWIC).	NEMA EIA Regulations 2010
7.	37-Spot Coalbed Methane Bulk Yield Test	-	No record of a Waste Management License issued for the project could be found on the SAWIC.	NEMA EIA Regulations 2006
8.	Zonnebloem Opencast	-	No record of a Waste Management	NEMA EIA

No.	Project Title	Waste Management License Granted		NEMA EIA Regulatory Regime
	Coal Mine		License issued for the project could be found on the SAWIC.	Regulations 2010
9.	Proposed Waste Site project	-	No record of a Waste Management License issued for the project could be found on the SAWIC.	NEMA EIA Regulations 2010
10.	Upgrade at the Southern Waste Water Treatment Works	-	No record of a Waste Management License issued for the project could be found on the SAWIC.	NEMA EIA Regulations 2010

4 SINGLE CASE ANALYSIS AND DISCUSSION

For this study, ten EIA reports which were compiled in support of Waste Management License Application were reviewed using the adapted review package. As previously mentioned all reports which are contained in the sample, were placed in the provincial domain as part of the legislative process that was followed and were obtained in this manner. A summary of the most significant findings for each case study in relation to the four Review Areas is provided below.

4.1 EIA 1: Conversion of Quarries to Asbestos Containing WDF

4.1.1 Description of project

This case study entailed converting derelict dolerite quarry to a hazardous waste facility for the disposal of Asbestos Containing Waste (ACW). Although the project activities associated with the Conversion of Quarries to Asbestos Containing Waste Disposal Facility (WDF) Project, the project formed part of the greater asbestos remediation program initiated by Transnet. The following overarching elements formed part of the project:

- Ensuring that the quarries are safe with regards to slope stability;
- Conversion of the quarry to accept ACW;
- Construction and upgrade of facilities to ensure the appropriate management of the facility;
- The safe and controlled receipt and placement of ACW;
- The safe and correct disposal of ACW;
- The closure of the disposal facility; and
- The post closure monitoring of the facility.

4.1.2 Conformance to legislative requirements

Regulation 31(2)(e)(i) of the NEMA EIA Regulations 2010 require that the steps undertaken during the Public Participation Process (PPP) in accordance with the Plan of Study be provided. Although it is indicated whether comments were received from Commenting Authorities, Interested and Affected Parties as well as stakeholders, a summary of the PPP actions carried

out in relation to Plan of Study that was provided in the Scoping Report is not provided. A comprehensive description of alternative which had been considered for the disposal of the ACW materials provided. Additionally a description of the feasibility and reasonability of alternatives is also provided.

Regulation 31(2)(d) which require that a description of alternatives which had been considered for the planned activity be described. Although the key findings of the environmental impact assessment is described in the Environmental Impact Statement, a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives is not provided. The requirements of Regulation 31(2)(o) which specifies the information to be contained in the EIS is therefore only partially met.

4.1.3 Best Review Area

Review Areas 1, 3 and 4 were graded as Satisfactory (Grade B) and were the best performed Review Areas. Review Areas 1, 3 and Review Area 4 were graded as Satisfactory (Grade B). Although Review Area 4 had the highest frequency of Well Performed (Grade A) scores assigned to the review categories, deficiencies which were observed in this area included, the omission of chapter summaries (Review Sub-Category 4.1.4) in the EIA Report. Review Area 2 was graded as Just Satisfactory (Grade C) largely as a result of the Unsatisfactory score (Grade F) assigned to Review Category 2.2 (Identification of impacts) and Review Category 2.5 (Assessment of Impact Significance).

The proposed waste management activities were described comprehensively and provide the reader with a clear understanding the planned activities and the need for the activities to take place. Review category 1.1 (Description of the development) was rated as well performed (Grade A). Although a thorough account of the need and desirability (Review Category 1.1.1) of the planned Waste Management Activities was provided and which related to the Integrated Development Framework and Spatial Development Framework of the area, it was noted that the NEMA Need and Desirability Guideline (Government Notice No. 792 of 2010) was not

considered. Notwithstanding the fact that the NEMA EIA Regulations 2010 calls for all applicable guidelines in respect of the assessment process to be considered, the information provided did to a certain extent answer the common questions to be asked when addressing the need and desirability of a project as is defined in the aforementioned guideline.

Review Category 1.2 was rated as being just satisfactory (Grade B) owing to the grades assigned to Review Category 1.2.3 (Grade F) and Review Category 1.2.4 (Grade F). The estimated duration of the various project lifecycle phases could be derived from the Duration of the impact described in the Impact Assessment Methodology where a Short-Term impact is described as "*The environmental impact identified will operate for the duration of the construction phase or a period of less than 5 years, whichever is the greater*". It can therefore be assumed that construction period is unlikely to exceed a period of 5 years. The estimated duration of the various project lifecycle phases was therefore not pertinently addressed in the report.

The descriptions of the waste provided relating to the waste types, volumes and proposed handling of the waste were meticulously described. Accordingly Review Area 1.3.1 was graded as Well Performed (Grade A). The flow diagram which shows the asbestos disposal process demonstrated that aspects concerning the source of the waste to the disposal of the waste were well thought through and assists the reader in understanding the context of the planned Waste Management Activities. The description of the receiving environment associated with the planned management activities (Review Category 1.4) was rated as having been Satisfactorily (Grade B) addressed.

Although not explicitly relating the description of the receiving environment, given the nature of the planned Waste Management Activities, the source-receptor pathway was taken into account when scoring the review category. Review Category 1.5 was rated as Just Satisfactory, owing to the lack of reference of source of the information used to populate the receiving environment description. Although it is generally the findings of the specialist studies that are used to describe the receiving environment, it should be indicated as such non-the less. Review

Category 1.5.3 was however rated as Well Performed (Grade A) as it was demonstrated that local land use plans and policies had been taken into account. Although provision for the planned project activities had not been made in the Integrated Development Plan (IDP) the planned project would not hinder any developments for which provision had been made in the IDP. Based upon the assessments of Categories 1.1-1.5, Review Area 1 was assessed as having been satisfactory addressed (Grade B).

4.1.4 Worst Performed Review Area

Review Area 2 (Identification and evaluation of key impacts) was graded as Just Satisfactory (Grade C). The lower grade given to this Review Area 2 is largely as a result of each of the Review Categories being poorly addressed. Even though the Description of all possible effects of the project on the environment is adequately addressed (assessed as Well Performed) omissions such as describing anticipated impacts on all environmental attributes (Review Category 2.1.2) were considered as Just Satisfactory. Furthermore, impacts arising from non-standard operating conditions (Review Category 2.1.3) and impacts arising from deviation of baseline conditions (Review Category 2.1.4) did not come across clearly. Accordingly Review Category 2.13 and Review Category 2.1.4 were assessed as Very Unsatisfactory. Although the impacts on society associated with the release of asbestos fibres are described, these impacts in relation to the expected incident rate throughout the project lifecycle were not addressed. Consequently, Review Category 2.5 (Assessment of impact significance: The expected significance that the projected impacts will have for society) was rated as Very Unsatisfactory. Overall Review Category 2 was assessed as being just satisfactory owing to the aforementioned omissions.

The description of alternatives (Review Category 3.1.1) for the planned Waste Management Activities was thoroughly addressed and accordingly rated as Well Performed. Mitigation Measures (Review Category 3.2) was rated as Just Unsatisfactory (Grade C). Although mitigation measures were provided, the rationale behind the measures was not provided.

Within a South African legislative context, the mitigation measures put forward during the EIA Phase is carried over to an Environmental Management Programme (EMPr). The EMPr becomes a “living document” which pins down the management measures which are to be implemented throughout the project lifecycle. Taking the aforementioned into account, although the roles and responsibilities of those responsible for implementing the mitigation and measurement measures are not provided in the EIR, it was addressed in the EMPr. Review Category 3.3 (Commitment to mitigation) was therefore rated as Well Performed. Overall Review Category 3 was assessed as being Satisfactory.

Although not a legal requirement in terms of the NEMA EIA Regulations 2010, the Best Practicable Environmental Option (Review Category 4.1.2) relating to the proposed Waste Management Activities was addressed and described. Accordingly Review Category 4.1.2 was assessed as Well Performed (Grade A). Summaries (Review Category 4.4.4) providing an overview of the information provided in each chapter was not provided. Although a Bibliography is included in the report, references (Review Category 4.1.5) to sources of information presented in the body of the report were not provided. With regards to the overall presentation of the report (Review Category 4.1) was rated as Satisfactory.

The information provided in the EIR was structured in an easily comprehensively manner. Accordingly Review Category 4.2 was assessed as Well Performed (Grade A). The Opinion provided by the EAP (Review Category 4.4.3) concerning the risk that the planned project poses to the receiving environment and whether it is recommended that Environmental Authorisation be granted was based on the information provided in the report. The Environmental Impact Statement provided a summary of the most significance impacts which emanate from the implementation of the planned Waste Management Activities. Taking the aforementioned into account, Review Category 4.4 as well as the Overall Score of Review Category 4 was assessed as Well Performed. Based on the information presented in the report, it is deemed as Satisfactory (Grade B). In terms of the minimum requirements stipulated in the NEMA EIA Regulations 2010, the EIR would be regarded as satisfactory. It did however fair not to well

when considering the extent to which the Identification and Evaluation of Impacts were addressed. This could however be accounted to the fact that a universal Impact Assessment Methodology is not adopted by all EAPs in South Africa, thereby leaving room for each to develop and adopt their own impact assessment methodology.

4.2 EIA 2: Underground Coal Gasification Pilot Project and Associated Infrastructure in support of co-firing of gas at the Majuba Power Station

4.2.1 Description of project

EIA Report 2 is centred on converting coal *in situ* into combustible gas that can be used for power generation, which is referred to as Underground Coal Gasification (UCG). The UCG initiative forms part of Eskom's initiatives to diversify fuel supply by adopting clean coal technologies.

UCG is defined as a "*process carried out on "un-minable" coal seams. These are coal seams that are uneconomic to mine using the conventional coal mining methods e.g. open cast or underground mining. UCG involves injecting steam, air or oxygen into a cavity created in an underground coal seam, to form a synthetic natural gas*". Essentially by means of utilising historically un-minable and inaccessible coal resources by conventional mining methodologies, UCG demonstrates the accessibility of alternative new, low-cost, and environmentally compliant energy resource for Eskom and the country.

4.2.2 Conformance to legislative requirements

4.2.3 Best Review Areas

An overall rating of Just Satisfactory (Grade C) was given to Review Area 2 which deals with the identification and evaluation of key impacts. An area of concern included Review Category 2.2.3 which considers the identification and assessment of key impacts. Although reference is made to environmental issues which were identified during the Scoping Phase, it was not clear which issues were identified during Scoping and whether these issues were carried over to and

addressed in the EIR Phase. Furthermore, a clear distinction between impact magnitude and impact significance (Review Category 2.5.1) was not provided.

The manner in which alternatives were addressed in the report was regarded as Just Satisfactory. The information presented in the report at times seemed to lean towards motivating rather than providing alternative means by which the objective of the project could be reached. In particular, a comparative analysis of the alternatives (Review Category 3.1.4), providing justification for the selected preferred alternative was not provided. This is of particular concern as the selection of the most environmental friendly alternative could provide the key to preventing rather than mitigation impacts on the receiving environment.

4.2.4 Worst Performed Review Area

No reference list was provided in the report (Review Category 4.1.5) which could potentially lead to the questioning of the credibility of the information presented in the report. The Best Practicable Environmental Option was also not considered in the EIR Process (Review Category 4.1.2). Regardless the overall presentation of the report was considered as Satisfactory (Grade B).

It was found that the Waste Management Activities (Review Category 1.1.1) associated with the proposed project did not come across clearly in the project description provided. Furthermore, a clear description of the need and desirability (Review Category 1.1.1) was not clear, but rather took the form a motivation for the proposed project. As a general observation, the manner in which the information is presented in the report would likely be difficult for a non-specialist to comprehend. The application of the Waste Management Hierarchy (Review Category 1.1.6) was not addressed in the report. Although one could derive who the applicant for the planned project was, the details of the proponent as required by the NEMA EIA Regulations 2010 were not provided.

Very little information concerning the onsite land requirements of the planned project activities and the duration of each land use was provided. Accordingly Review Category 1.2 was

assessed as Not Satisfactory. Although a thorough description of the anticipated wastes to be generated by the planned project activities was provided (Review Category 1.3.1 and Review Category 1.3.2), an account of the methods of obtaining quantity of the wastes (Review Category 1.3.3) was not provided. While the receiving environment is described (Review Category 1.5.1) the methodology and rationale for identifying what is considered as important component of the affected environment is not provided. Overall a final grade C (just Satisfactory) was given to Review Area 1, largely owing to the fact that although thoroughly provided, the information presented conforms to regulatory requirements.

4.3 EIA 3: Venetia Mine, Limpopo

4.3.1 Project Description

EIA Report 3 entails licensing the formalization of an existing waste salvage yard to a waste management (disposal) facility at an existing diamond mine. Wastes which are generated at all mining areas, apart from the Bus Deport and the Wellness Centre, are transported to the existing Salvage Yard. The existing Salvage Yard fundamentally serves as a waste storage area, prior to waste being removed off-site. The upgrade of the existing salvage yard to a more formalised waste management facility will be carried out over an estimated period of four years. Included into the scope of the WMLA were the storage of waste tyres in a demarcated area next to and the disposal of inert waste such as building rubble and demolition waste (inclusive of wood) within a demarcated area.

4.3.2 Conformance to legislative requirement

A document roadmap which provided the report's structure, in terms of the NEMA EIA regulatory requirements was included in the report. This table clearly illustrated that each of the provisions in the NEMA EIA Regulations pertaining information to be included in the EIA Report was addressed, thereby conforming to the aforesaid Regulations. to reach the preferred alternative.

4.3.3 Best Review Area

Review Areas 1, 2 and 3 were graded as Satisfactory. A comprehensive description of all facility/ies associated with the Waste Management Activity /ies including the design and size of the facility (Review Category 1.1.2) were provided. EIA Report 3 was also the only report to describe the estimated duration of the construction phase, operational phase and, where appropriate, decommissioning phase (Review Category 1.2.3). The commitment to mitigation was clearly demonstrated in the EMPr, and accordingly Review Category 3.3 was deemed as Well Performed. Overall Review Category 3 was assessed as being Just Satisfactory. Although alternatives (Review Category 3.1) were addressed in the report, a comparative assessment of these was not done. It was therefore not clear which rational was adopted.

4.3.4 Worst Performed Review Area

Review Area 4 was rated as Very Unsatisfactory in particular owing to the fact that certain regulatory requirements such as providing a reasoned opinion as to whether or not the project activities should be authorised (Review Category 4.4.3) were not provided. The overall presentation was assessed as being Well Performed. The authors of the EIR also failed to provide an Environmental Impact Statement (EIS) (Review Category 4.2) thereby failing to highlight potentially severe impacts as well as potential positive impacts. In terms of the NEMA EIA Regulations 2010, the EIS is intended to provide a summary of the key findings of the EIA and provide a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives.

4.4 EIA 4: Amadwala Integrated Waste Management Facility

4.4.1 Description of project

EIA Report 4 concerns the establishment of a general and hazardous waste management facility, known as the “Amadwala Integrated Waste Management Facility”. The facility would be intended to largely serve general and hazardous waste generators in the Mpumalanga and Gauteng Provinces. It was estimated that the facility would receive approximately 50,000 tonnes

(t) of various general and hazardous wastes including liquid/sludge and solid industrial, commercial and mining wastes per month once fully operational. Wastes received by the proposed Site will then either be treated, recycled, recovered and/or disposed. The following key waste management components were considered by the proponent for the handling of general and hazardous wastes:

- Waste Storage;
- Waste Recycling and Recovery;
- Solid/sludge Waste Treatment (excluding incineration);
- Effluent/liquid Waste Treatment Plant; and
- Disposal of general and hazardous waste.

4.4.2 Conformance to legislative requirements

The information present in EIA Report 10 met the information requirements laid down in the NEMA EIA Regulations. Adequate information was provided to address each of the information requirements which are provided in the NEMA EIA Regulations.

4.4.3 Best Review Area

A comprehensive description of the planned development was provided and accordingly Review Category 1.3 was assessed as Well Performed. The associated Waste Management Activities (Review Category 1.1.1) were described in sufficient detail as well as providing the rationale for the planned activities. Additional tools (Review Category 1.13) which were employed, such process flow diagrams and illustrations of the planned facility facilitated gaining an understanding in of the various components of the Furthermore, it was also evident that the Waste Management Hierarchy had been applied (Review Category 1.1.6). Although it was reference was made to the key findings and impacts identified by the specialist, no reference was made to existing knowledge. It is also worth noting that the time-frames / duration for each project lifecycle phase was provided (Review Category 1.2.3).

Worth noting is the fact that the uncertainty associated with the information and methods used in in the assessment of the impacts was referred to. Environmental consequences which may emanate from non-standard operating conditions (Review Category 2.1.3), although not explicitly referred to, was provided in some instances.

4.4.4 Worst performed Review Area

Although a thorough account of all alternatives which had been considered was provided, a comparative analysis of these impacts was not provided (Review Category 3.1.4). The adoption of mitigation measures was also by and large focus on mitigating rather than preventing the impacts from transpiring.

4.5 EIA 5: Waste Management License for Silicon Smelters

4.5.1 Description of project

The proponent produces high purity metallurgical and chemical grade silicon. The production process which is carried out to produce silicon can be separated into three stages namely, raw materials handling stage, the smelting and purification stage and the crushing of the final product.

This blend is then fed to furnaces where it is smelted to produce silicon metal. Micro-silica (silicon dioxide) is captured from the furnace gasses through three bag houses and undergoes densification in the Microsil Plant to produce microsil which is sold to the cement industry. Waste water (effluent) high in silt is generated, during the crushing, screening and washing of the quartz, prior to the processing thereof. This is done to produce suitably sized furnace feed. The effluent is diverted to six Evaporation Dams by means of an unlined trench for containment and evaporation. As a result of the high load of total suspended solids (silt) in the effluent, the trench and Evaporation Dams had become silted and required excavation for continued use. Consequently, the proponent proposed to excavate and remove the silt material to ensure the continued long term use of the Evaporation Dams.

It was also proposed to re-use the excavated silt material as backfill offsite at a Quartz Quarry located approximately 3 km from the site. An analysis of the silt material was done to identify the hazard rating of the waste material (sediment). The material was assessed per SANS 10234 of 2008 and Government Notice Regulation (GNR) 634 of 2013 to quantify the hazard rating and was also assessed against the National Norms and Standards for the Assessment of Waste to Landfill Disposal (GNR.635 of 2013). The silt material contained in the Evaporation Dams was determined to be non-hazardous (per SANS 10234 of 2008 and GNR.634 of 2013), Type 3 Waste that can be disposed of on a GLB+ landfill (per GNR.635 of 2013).

4.5.2 Conformance to regulatory requirements

The information present in EIA Report 5 met the information requirements laid down in the NEMA EIA Regulations. Adequate information was provided to address each of the information requirements which are provided in the NEMA EIA Regulations.

4.5.3 Best Review Area

The means of transporting the required material to the required site was described and accordingly Sub-Category 1.2.5 was rated as Satisfactory (Grade B). Review Category 1.4 performed the best out of the categories included in Review Area 1 and was rated as Well Performed (Grade A). A concise but comprehensive description of the receiving environment was provided. Review Categories 2.2 (Identification of impacts), 2.3 (Scoping) and 2.4 (Prediction of Impact Magnitude were graded as Well Performed (Grade A). None of the sub-categories included in Review Area 2 were assessed as Unsatisfactory.

A comparative analysis of the identified alternatives was provided, and accordingly the environmental consequences associate with each alternative was taken into account. Accordingly, Sub-Category 3.1.4 was assessed as Well Performed (Grade A). It was however noted that mitigation measures did not explicitly consider aspects such as the modification of the project (Sub-Category 3.2.3) and was accordingly rated as Just Satisfactory (Grade C). The overall presentation was graded as Well Performed. The layout of the report facilitated ease of

finding information that would be required to make an informed decision concerning grating a WML.

4.5.4 Worst Performed Review Area

Although each of the four Review Areas was graded as Satisfactory (Grade B), Review Category 4.1.4 (Chapter Summaries) was poorly addressed. Furthermore no reference was made to existing data sources (Review Category 1.5.2) including local authority records and previous studies done was referred to. Accordingly Review Category 1.5.2 was graded as Very Unsatisfactory.

4.6 EIA 6: Matimba Power Station Ash Disposal Facility

4.6.1 Description of project

EIA Report 6 entails the construction and operation of a new Ash Disposal Facility (ADF) for the disposal of ash that is generated as a waste product from combustion of coal from the power station. At the time when the WMLA was made ash was disposed of approximately 3 km south of the Matimba Power Station. The new ADF would ensure that adequate capacity exist for continued ashing for the duration of the operating life of the Power Station.

4.6.2 Conformance to regulatory requirements

The information present in EIA Report 6 met the information requirements laid down in the NEMA EIA Regulations. Adequate information was provided to address each of the information requirements which are provided in the NEMA EIA Regulations.

4.6.3 Best Review Areas

A Waste Classification Study was carried out for the planned project. Accordingly, sufficient detail concerning the waste types and volumes was provided (Sub-Category 1.3.1). Review Category 1.3.1 was therefore graded as Satisfactory (Grade B). Overall Review Area 2 was rated as Satisfactory, with no Review Categories graded as Unsatisfactory. Review Category 2.2 (Identification of impacts) was graded as Well Performed (Grade A).

4.6.4 Worst Performed Review Areas

Review Category 3.1 was graded as Not Satisfactory (Grade E), since only site alternatives were considered. No comparative analysis of identified impacts was considered.

4.7 EIA 7: 37-Spot Coalbed Methane Bulk Yield Test

4.7.1 Description of project

At the time when the WMLA was made the proponent was in the process of investigating the feasibility of extracting coalbed methane gas from the Waterberg Coalfield and had proposed to undertake a coalbed methane bulk yield test to further determine the gas resource. At this time exploration for coalbed methane in the project had been undertaken for longer than a decade, and environmental authorisation had been granted to extract coalbed methane gas at a local pilot plant comprising five gas wells. This is termed a '5-spot' comprising four perimeter wells and one central well from which both water and gas are abstracted. The existing operational first 5-spot pilot project provided valuable data to verify predicted well field production characteristics and gas resource estimates.

Case Study 7 entails the development of 37 additional wells in a different geological resource block to the existing 5-Spot. The gas yield from the bounded wells was anticipated to be representative of well field conditions and data will be used to calibrate the gas resource estimates and production forecasts for the broader well field. The extracted gas will be used to produce up to 10 MW of electricity.

4.7.2 Conformance to regulatory requirements

The information present in EIA Report 7 met the information requirements laid down in the NEMA EIA Regulations. Adequate information was provided to address each of the information requirements which are provided in the NEMA EIA Regulations.

4.7.3 Best Review Area

A comprehensive description of the receiving environment was provided (Review Category 1.4) was provided and was graded as Well Performed (Grade A). This in turn provided an adequate baseline of the environment on which to base the rating of significant impacts.

4.7.4 Worst Performed Review Areas

Owing to the nature of the project, alternative means of depicting the WMAs was required. However, although the planned activities were described, no illustration of the process was provided (Sub-Category 1.1.4). Furthermore, the nature and required material required throughout the project lifecycle was not provided (Sub-Category 1.1.5). The duration of the various project phases was provided (Sub-Category 1.2.3). Review Category 1.3 was graded as Just Satisfactory (Grade C) owing to the waste types and volumes not being provided.

Overall Review Area 2 which considers the Identification of Impacts was graded as Just Unsatisfactory. Impact significance (Review Category 2.5) was not clearly articulated nor was a justification for the methodology provided. An overall rating of Just Satisfactory was given to Review Area 3. Although commitment to mitigation was clearly demonstrated (Review Category 3.3), poorer performing Review Categories included Review Category 3.1 and 3.2. No Environmental Impact Statement was provided. Subsequently potentially high significance impacts were not emphasised (Sub-Category 4.3.1), nor was an opinion provided by the EAP (Sub-Category 4.3.3) concerning the granting or refusal of the WML.

4.8 EIA 8: Zonnebloem Opencast Coal Mine

4.8.1 Description of project

Case Study entailed the establishment of a new opencast coal mine in the Mpumalanga Province. The establishment of a new opencast coal mine triggered several Waste Management Activities.

4.8.2 Conformance to legislative requirements

The information present in EIA Report 8 met the minimum information requirements laid down in the NEMA EIA Regulations. Adequate information was provided to address each of the information requirements which are provided in the NEMA EIA Regulations.

4.8.3 Best Review Area

Review Category 2.2 was graded as Well Performed (Grade A). It was evident that a thorough Public Participation Process had been conducted as part of the EIA Process.

4.8.4 Worst Performed Review Area

Review Category 1.3 (Wastes) performed the poorest and was graded as Not Satisfactory (Grade E). No classification of the anticipated waste to be generated was provided (Sub-Category 1.3.1). The manner by which the volumes of waste to be generated (Sub-Category 1.3.3) was also not apparent. Review Area 3 performed the poorest and was overall rated as Not Satisfactory (Grade F). The poor score is large owing to the lack of consideration of alternative relating to the Waste Management Activities. Each of the Sub-Categories contained in Review Category 3.1 (Alternatives) was rated Very Unsatisfactory (Grade F).

4.8.5 Review Area 4: Communication of results

Although an Executive Summary was provided (Sub-Category 4.4.1), the information provided did not conform to the requirements of the Non-Technical Summary as provided in the Review Checklist. The executive summary also failed to provide an indication of the main environmental consequences associated with the WMAs (Sub-Category 4.4.2) and was graded as Not Satisfactory (Grade E). No opinion concerning the granting or refusal of the WML was provided (Sub-Category 4.4.3).

4.9 EIA 9: Proposed Waste Site project

4.9.1 Project Description

The project is centred on developing a waste site for the disposal of non-hazardous and domestic waste which cannot be recycled at a mine. Although paper, plastic, wood and metals are sorted for recycling at the various sections of the mine, additional sorting will be carried out at the waste site. The Applicant also proposes to temporarily store hazardous waste and salvageable items which contains hazardous substances in containers in a demarcated enclosed area on the site (less than 10 tonnes per day).

4.9.2 Conformance to legislative requirements

The information present in EIA Report 9 met the minimum information requirements laid down in the NEMA EIA Regulations. Adequate information was provided to address each of the information requirements which are provided in the NEMA EIA Regulations.

4.9.3 Best Review Area

The description of the Receiving Environment (Review Category 1.4) was rated as Well Performed (Grade A). Review Categories 2.1 (Definition of Impacts), 2.2 (Identification of Impacts) and 2.3 (Prediction of Impact Magnitude) was graded as Well Performed (Grade A). It was evident that the key impacts identified during the Scoping Phase were taken forward to the EIA Phase for assessment. Accordingly, Sub-Category 2.3.3 was graded as Well Performed (Grade A). A Waste Management Hierarchy plan was provided (Sub-Category 1.1.6) which indicates that the application thereof was considered. Review Area 4 was assessed as Satisfactory (Grade B). Review Category 4.1 was graded as Just Satisfactory.

4.9.4 Worst Permed Review Area

A very brief need and desirability of the planned WMAs (Sub-Category 1.1.) and rather provided a summarised version of the planned activities. A brief comparative assessment of alternatives was provided, cost implications considered in the assessment of the feasibility of the

alternatives (Sub-Category 3.1.4). The expected effectiveness of the mitigation measures was not provided (Sub-Category 3.2.3).

4.10 EIA 10: Proposed Solids Removal and Treatment Facilities Upgrade

4.10.1 Project Description

Case Study 10 entails the upgrading of the existing Southern Waste Water Treatment Works (SWWTW) aimed at reducing the quantity of suspended solids being disposed of at sea. The treatment process (through primary settling) will result in a reduction of the organic load discharged to sea. The settled solids will be removed and stabilised through a process of anaerobic digestion, before being dewatered.

4.10.2 Conformance to legislative requirements

The information present in EIA Report 10 met the information requirements laid down in the NEMA EIA Regulations. However in some instances the extent of information provided was only sufficient to comply with the “minimum” requirements.

4.10.3 Best Review Area

Review Areas 1, Review Area 3 and Review Area 4 were graded as Satisfactory (Grade B). In particular the information concerning the details of the planned WMAs was comprehensively addressed. The EAP demonstrated that a clear understanding of the aspects of the WMAs was obtained and therefore conveyed to the reader. Accordingly Review Category 1.3 (Wastes) was graded as Well Performed (Grade A). EIA Report 10 was the only report to provide a comparative assessment of the identified alternatives (Review Sub-Category 3.1.4) and therefore the only report in the Review Sample to be graded as Well Performed (Grade A). Review Category 2.2 was graded as Well Performed (Grade A). This is owing to the link made between the actual project activities and the environmental consequences associated with each.

4.10.4 Worst Performing Review Area

Although a description the planned Waste Management Activities, the aims and objectives thereof was not conveyed in enough details. Subsequently Sub-category 1.1.1 was graded as Just Satisfactory (Grade C). The Waste Management Hierarchy (Sub-Category 1.1.6) was not considered, and disposal was presented as the only option. Review Area 3: Alternatives and mitigation. The scope of and effectiveness of the mitigation measures which were put forward was not clear (Sub-Category 3.2.3).

5 CASE ANALYSIS AND DISCUSSION

5.1 Analysis of all Review Areas

The information presented in this chapter serves to provide a concise overview of the results obtained from subjecting each of the reports (i.e. case studies) included in the sample to adapted review package. Each of the ten (10) EIA Reports included in the sample were subjected to the review checklist which is described in Chapter 3.

To identify common trends in the quality of the report relating to both strengths and weaknesses it was considered necessary to provide an overview of the performance of the report for each of the four review areas. Therefore review categories which performed particularly well indicating an area of strength and those that were scored very low indicating an area of weakness.

A summary of the grades assigned to each Review Category for each of the ten (10) EIA Reports included in the Review Sample is provided in Table 5-1. A summary of the grades assigned to each Review Area for each of the ten (10) EIA Reports included in Review Sample is provided in Table 5-2.

Table 5-1: Summary of Category Scores for each EIA Report included in Review Sample

Review Category		Grade									
		EIA 1	EIA 2	EIA 3	EIA 4	EIA 5	EIA 6	EIA 7	EIA 8	EIA 9	EIA 10
1.1	Description of the development	A	B	C	B	B	C	C	E	B	C
1.2	Site Description	C	E	E	B	C	C	C	E	C	D
1.3	Description of waste	A	C	A	A	B	B	C	E	C	D
1.4	Environment Description	B	A	C	A	A	A	A	C	A	B
1.5	Baseline Conditions	C	F	F	C	C	B	B	B	B	C
2.1	Definition of impacts	D	C	C	B	B	B	D	B	A	C
2.2	Identification of impacts	F	B	A	B	A	A	A	A	A	A
2.3.	Scoping	E	C	D	A	A	C	D	B	A	D
2.4	Prediction of Impact Magnitude	B	B	C	B	A	B	C	A	B	B
2.5.	Assessment of Impact Significance	F	C	C	C	C	B	E	C	C	C
3.1.	Alternatives	A	F	E	C	B	E	C	F	C	D
3.2	Scope and effectiveness of mitigation measures	C	D	D	E	C	C	C	C	C	E
3.3	Commitment to mitigation	A	A	A	A	A	A	A	A	A	C

Review Category		Grade									
		EIA 1	EIA 2	EIA 3	EIA 4	EIA 5	EIA 6	EIA 7	EIA 8	EIA 9	EIA 10
4.1	Layout of the report	B	C	C	B	B	C	C	C	C	D
4.2	Presentation	A	B	A	A	A	B	A	C	B	B
4.3	Emphasis	A	A	F	C	B	B	F	E	B	B
4.4	Non-Technical Summary	A	A	F	C	C	B	C	E	B	B

Table 5-2: Summary of Review Area Scores for each EIA Report included in Review Sample

Summary of review area grades		EIA 1	EIA 2	EIA 3	EIA 4	EIA 5	EIA 6	EIA 7	EIA 8	EIA 9	EIA 10
1.	Description of the development	B	C	C	B	B	B	C	D	B	C
2.	Identification and evaluation of key impacts	C	C	C	B	B	B	D	C	B	B
3.	Alternatives and mitigation	B	D	C	C	B	C	C	E	C	D
4.	Communication of results	B	B	D	C	B	B	C	D	B	C

5.2 Analysis of Review Area 1

The requirements laid down in Review Area 1 are intended to provide a concise but thorough description of the planned Waste Management Activities (WMAs). For the impacts on the receiving environment associated with the WMAs to be identified and assessed, it is fundamental that a clear understanding of all elements of the WMAs has been obtained. Furthermore, as the NEMWA is by and large based on the principles of the Waste Management Hierarchy the application thereof was also assessed.

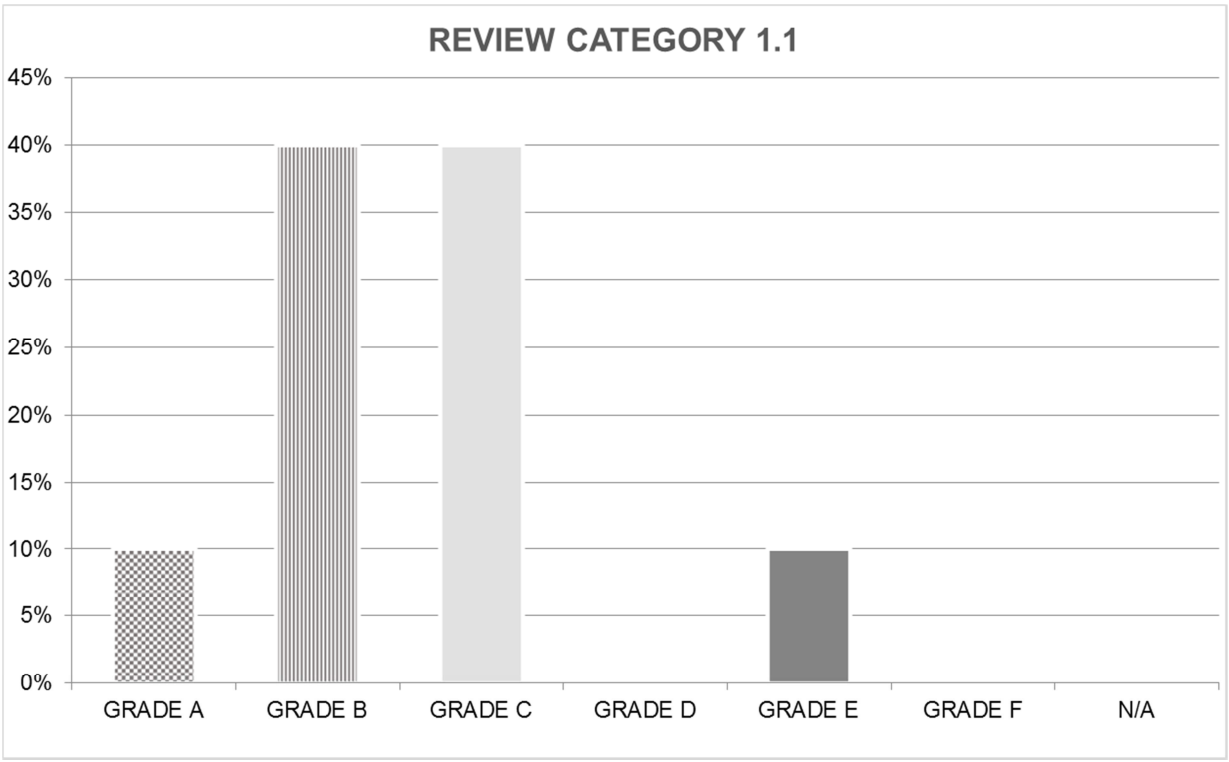

Figure 5-1: Grades of Review Category 1.1

For Review Category 1.1 only 10% (refer to Figure 5-1) of the reviewed EIAs were deemed as Well Performed (Grade A). Areas of concern however relating to the information requirements laid down in Review Category 1.1 was the omission of certain information such as the details of the EAP and Proponent which are required in terms of the NEMA EIA Regulations. It was also noted that the Need and Desirability (Sub-Category 1.1.1) of the planned WMAs in some instances appeared to principally motivate the project as opposed to providing adequate information which answers the twelve questions laid down in the NEMA Publication of Need and Desirability Guideline in terms of the EIA Regulations, 2010 (Department of Environmental Affairs, 2012:13). Additional omissions which were noted in the reviewed reports included the provision of the duration of the phases of the project lifecycle (Sub-Category 1.2.3) as well as the numbers of workers and/or visitors entering the development site during both construction and operational phases (Sub-Category 1.2.4).

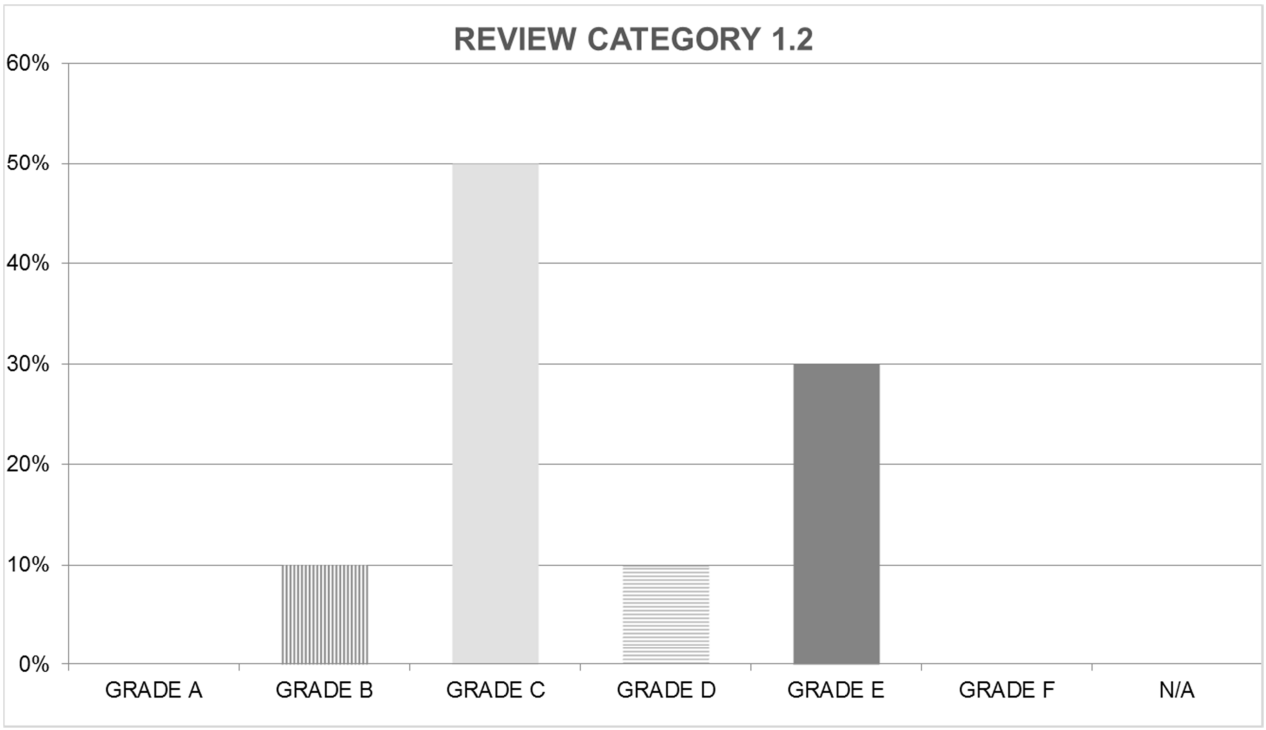

Figure 5-2: Grades for Review Category 1.2

For Review Category 1.2, although 50% of the EIA Reports included in the Review Sample was graded as Satisfactory (Grade C) (see Figure 5-2), the numbers of workers and/or visitors entering the development site during both construction and operation (Sub-Category 1.2.4) was poorly addressed in each of the EIA Reports. For Review Category 1.3 (see Figure 5-3) which concerns providing a description of the types and quantities of wastes which might be produced should be estimated, and the proposed disposal routes to the environment described only 30% of the sample was assessed as Well Performed (Grade A). In particular the methods by which the quantities of residuals and wastes were obtained were not always provided. In addition, the applicability of the definition of Waste provided in the NEMWA (as amended) was also not evident in most cases. Furthermore 10% of the sample was rated as Unsatisfactory for Review Category 1.3.

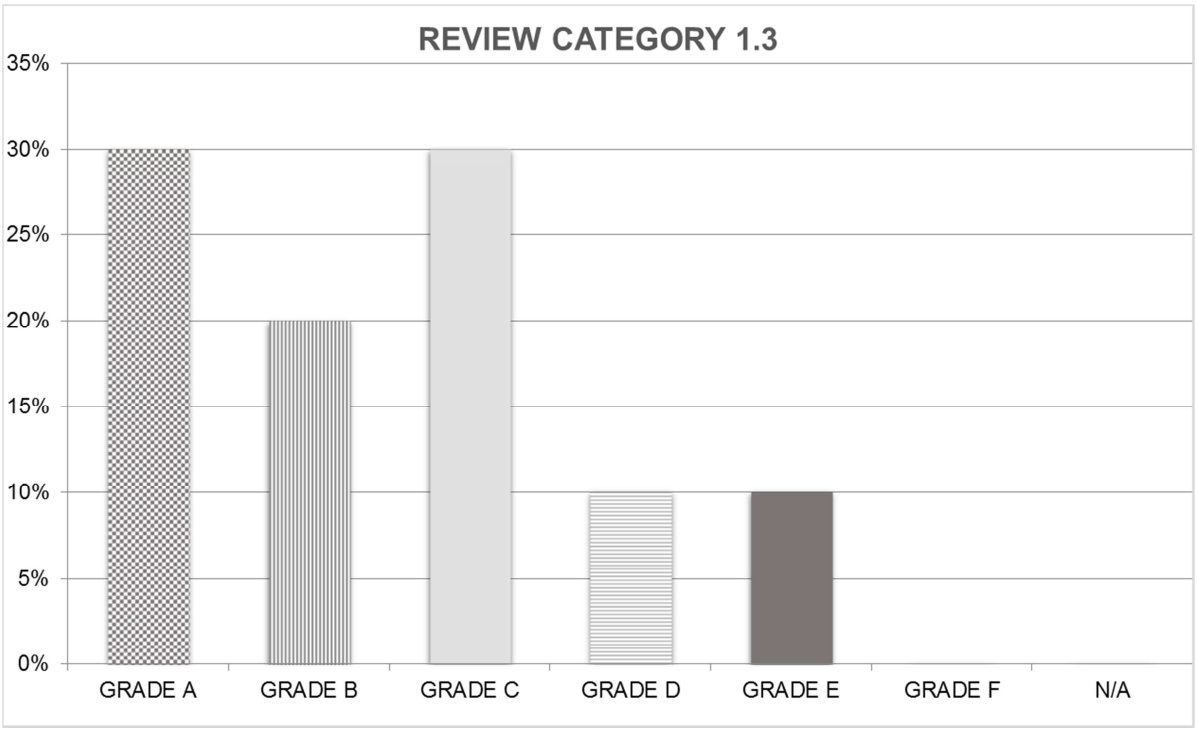

Figure 5-3: Review Grades for Review Category 1.3

The results obtained indicated that 60% of the sample provided an adequate description of the receiving environment (Review Area 1.4) (refer to Figure 5-4) and was rated as Well Performed (Grade A).

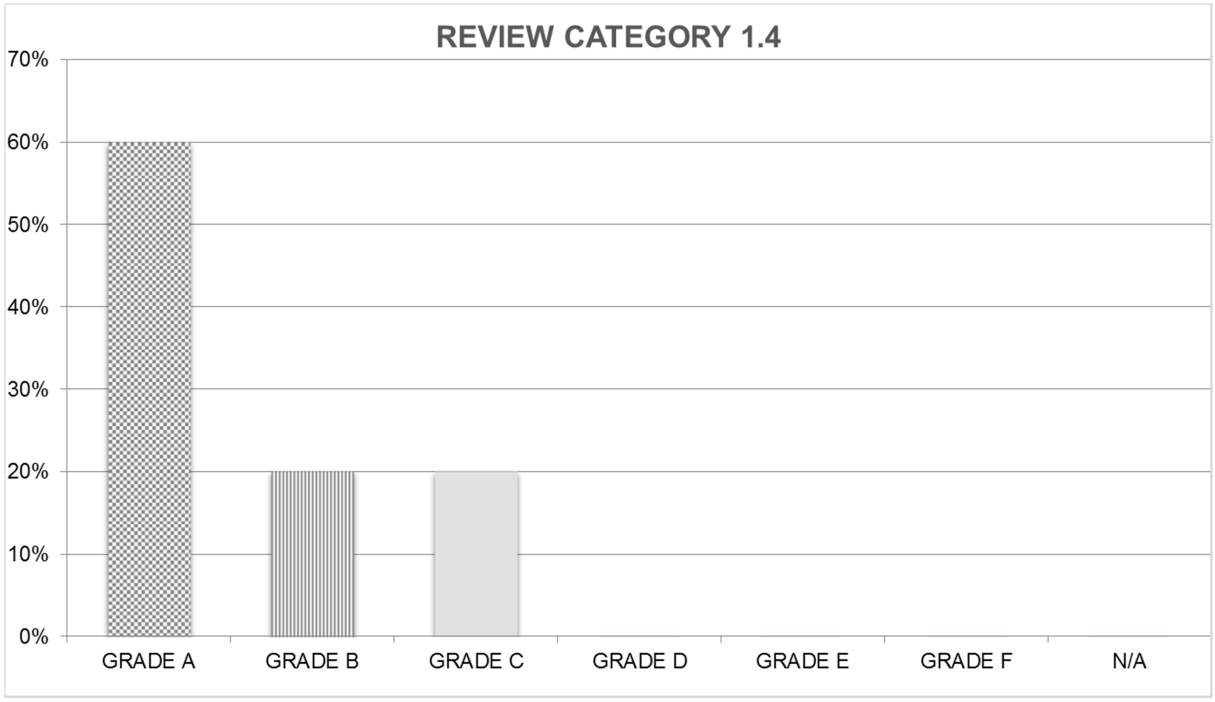

Figure 5-4: Review Grade for Review Category 1.4

In general, the description of the baseline conditions (Review Area 1.5) (see Figure 5-5) was assessed as being Satisfactory which due to the omission of knowledge gaps and reference to existing knowledge.

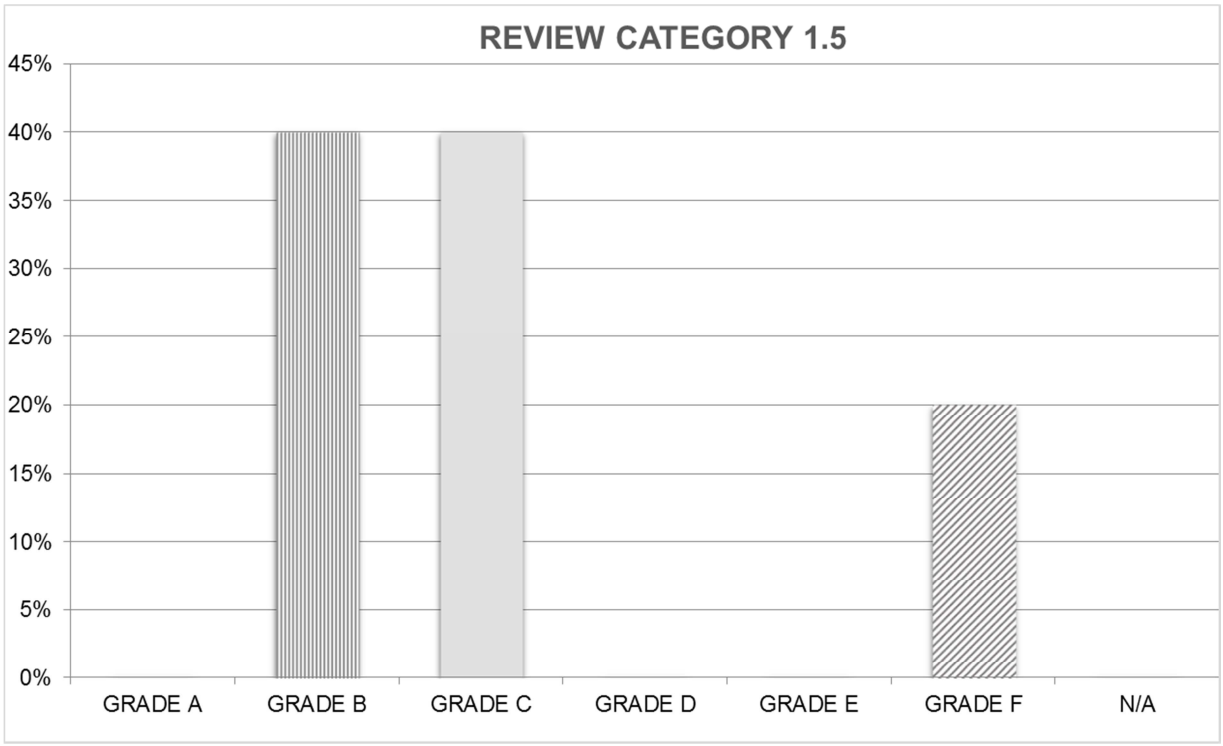

Figure 5-5: Review Grades for Review Category 1.5

5.3 Analysis of Review Area 2

The information requirements laid down in Review Area 2, aims to rate how well impacts associated with the planned Waste Management Activities (WMAs) were addressed. The information required in the various Review Categories and Sub-Categories which fall under Review Area 2, aim to establish a linkage between the implications of the implementation of the WMAs in terms of changes to the receiving environment.

Although 70% of the review sample was rated as Well Performed (Grade A) for the identification of impacts provided (Review Category 2.2) (refer to Figure 5-7) only 10% of the review sample was graded as Well Performed for the definition of impacts (Review Category 2.1) (see Figure 5-6). The lower percentage of the review sample which was graded as Well Performed (Grade A) for the definition of impacts (Review Category 2.1) is due to low grades given to Sub-

Category 2.1.3 (Impacts arising from non-standard operating conditions) and Sub-Category 2.1.4 (Impacts arising from deviation from Baseline conditions).

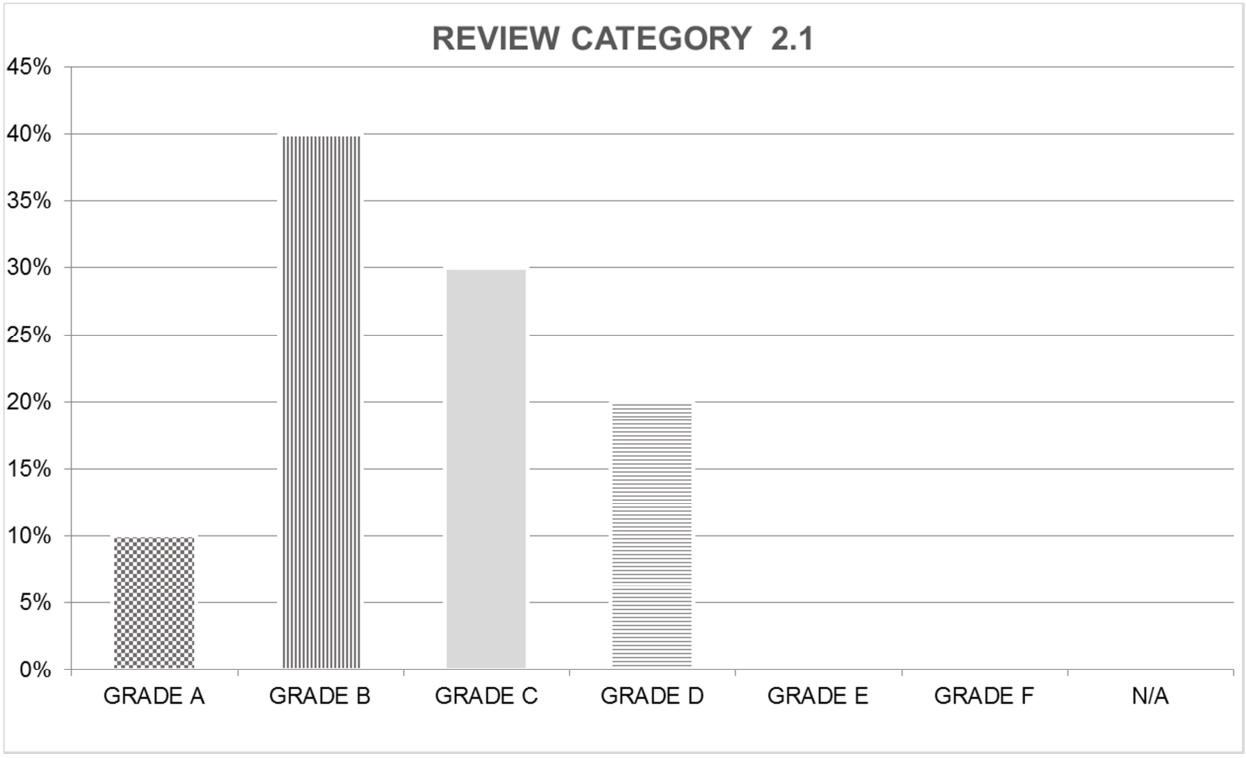

Figure 5-6: Review Grades for Review Category 2.1

The best performing Review Category 2.2 (Identification of Impacts) where 70% of the review sample was rated as Well Performed (Grade A) (refer to Figure 5-7). In general, detailed methodology for assessing the impacts was provided. Seemingly apparent shortcomings that were noted however included indicating the data used to estimate magnitude of main impacts and gaps in data. It could be derived that the input provided by the specialist input guided the identification and rating of the impacts, this should be none the less clearly indicated. Furthermore, in the case where an integrated EIA Report (for both NEMA EIA Listed Activities and listed WMAs) was collated a clear distinction was not made between the NEMA and WMAs specifically relating to the identification and assessment of anticipated environmental impacts. Accordingly, only 20% of the sample was rated as Well Done (Grade A) for Review Category 2.3, whilst 60% was assessed as Satisfactory (Grade B).

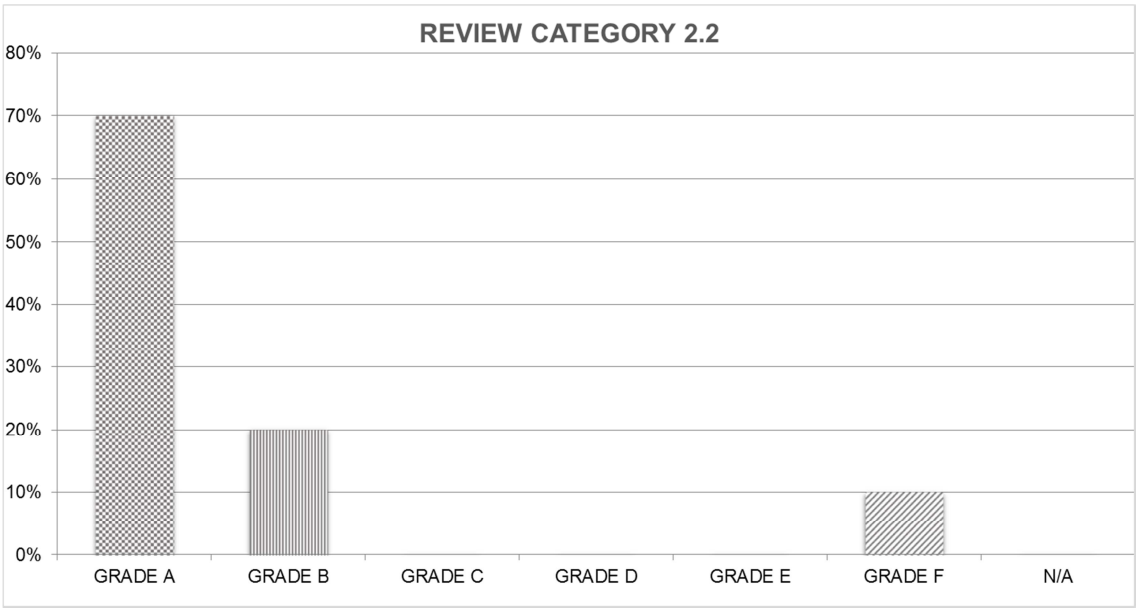

Figure 5-7: Review Grades for Review Category 2.2

Only 30% of the reviewed sample was rated as Well Performed for the Identification of Key Impacts (Review Category 2.3). The grades for Review Category 2.3 are shown in Figure 5-8. One of the objectives of the Scoping Process which precedes the Environmental Impact Reporting Process is the identification of the key issues to be addressed in the assessment phase (NEMA EIA Regulations 2014). For Review Category 2.5 (Assessment of Impact Significance) none of the reports included in the sample was rated as Well Performed (Grade A), whilst the bulk of the sample (70%) was assessed as being Just Satisfactory (Grade C). This rating for Review Category 2.5 is largely owing to the aspects including the significance of impacts in relation to national and international quality standards not always being provided. Furthermore, as previously mentioned the uncertainty associated with the information and methods used in in the assessment of the impacts were not always indicated.

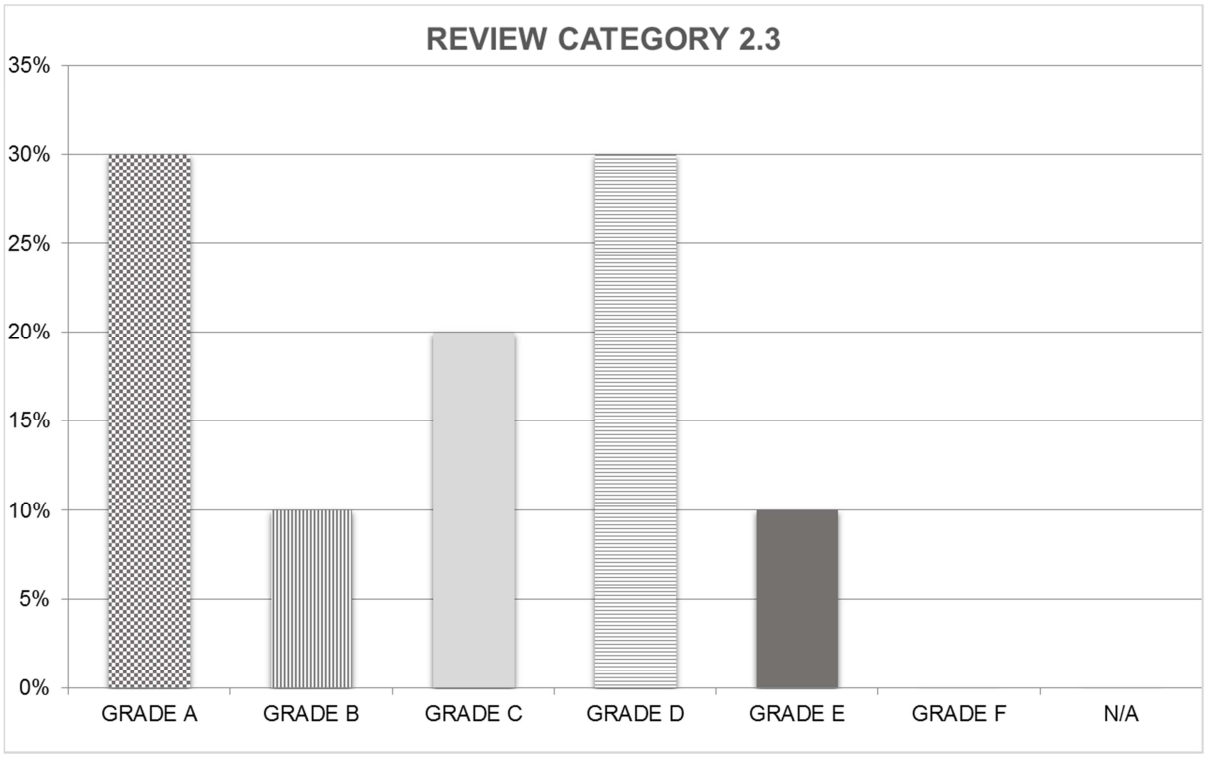

Figure 5-8: Review Grades for Review Category 2.3

For Review Category 2.4 (Prediction of Impact Magnitude) 60% of the Review Sample was graded as Satisfactory (Grade B), whilst only 10% of the Review Sample was graded as Satisfactory (Grade B) for Review Category 2.5 (Assessment of impact significance).

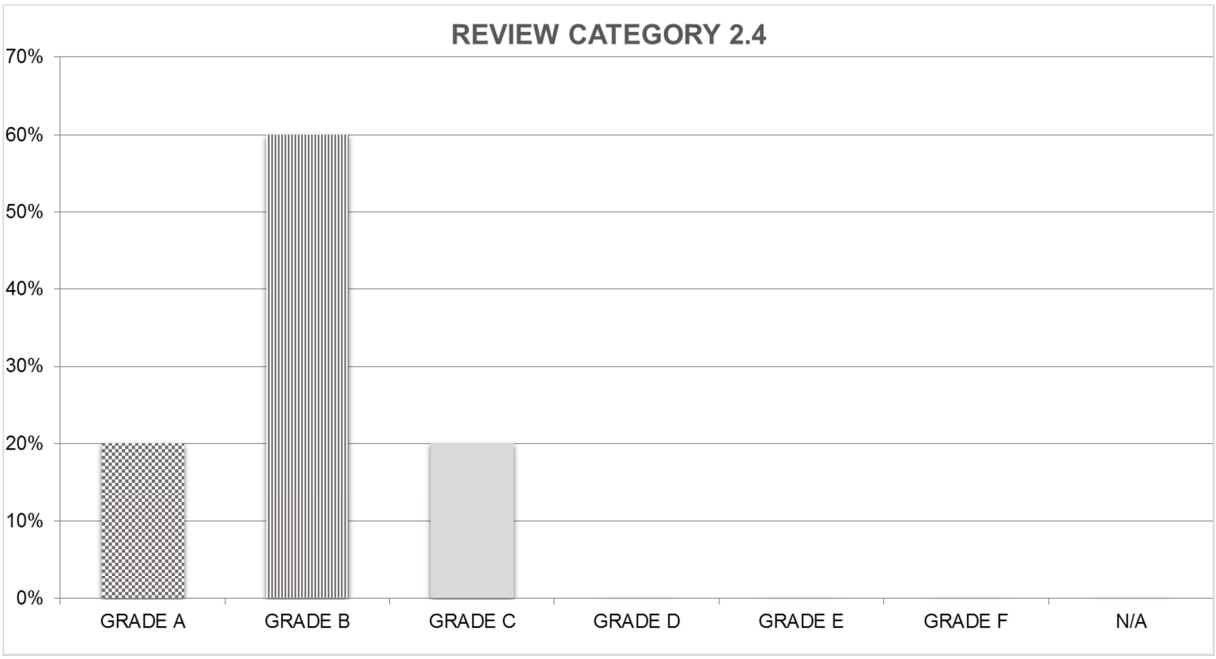

Figure 5-9: Review Grade for Review Category 2.4

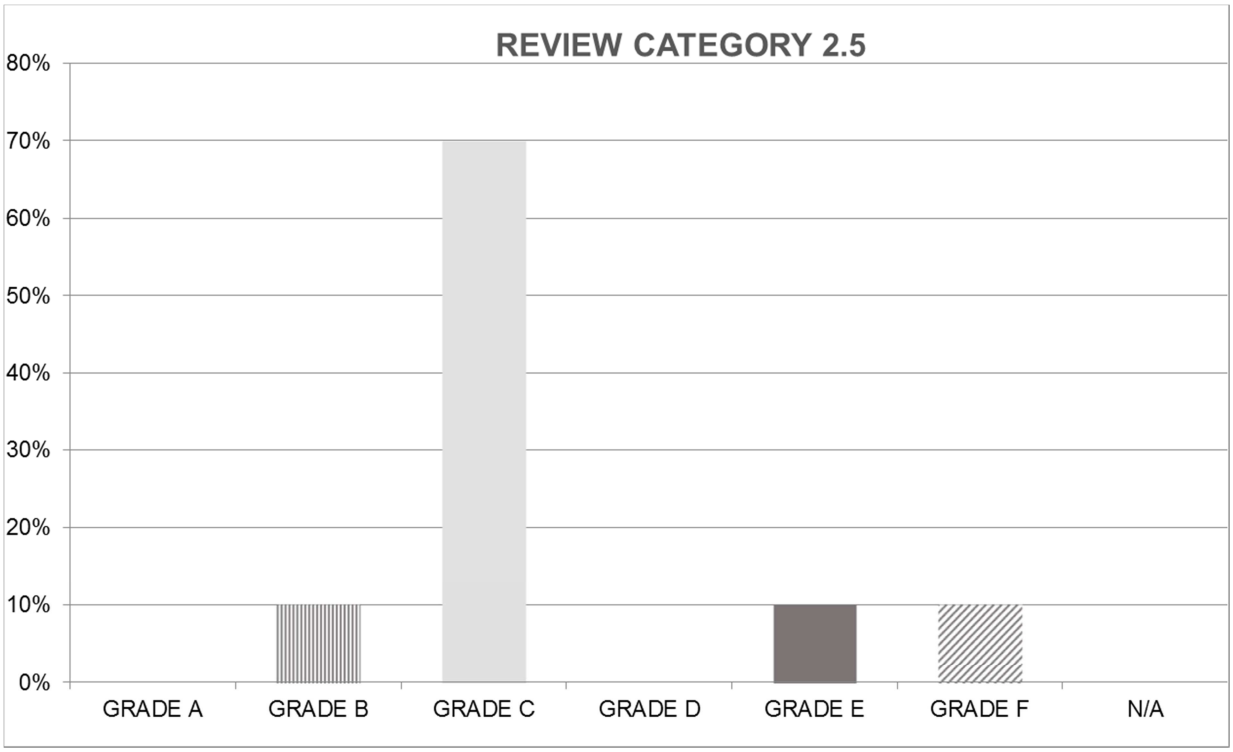

Figure 5-10: Grade for Review Category 2.5

5.4 Analysis of Review Area 3

Review Area 3 addresses alternatives considered and the quality of mitigation measures which are put forward. An evident shortcoming in the manner by which alternatives were addressed, was the lack of a comparative assessment of alternatives (Sub-Category 3.1.4) where 50% of the review sample was graded as Very Unsatisfactory (Grade F). Although alternatives were described, the environmental consequences associated with each were seldom provided. It was therefore not clear that the selected preferred alternative was necessarily the Best Practicable Environmental Option.

Overall 50% of the sample was rated as Just Satisfactory for Review Area 3 (refer to Figure 5-11). This is largely accountable to the poorer performance of Review Category 3.1 (Alternatives) (refer Figure 5-12) and Review Category 3.2 (Scope and effectiveness of mitigation measures) (see **Error! Reference source not found.**). Information concerning each of the Review Sub-Categories, namely the Consideration/description of alternative sites (Sub-Category 3.1.1), Consideration/description of alternative processes, designs and operating conditions (Sub-Category 3.1.2), unexpectedly severe adverse impacts identified (Sub-Category

3.1.3) and Comparative assessment of all alternatives identified (Sub-Category 3.1.4) was lacking in some instances and in some cases were only briefly addressed.

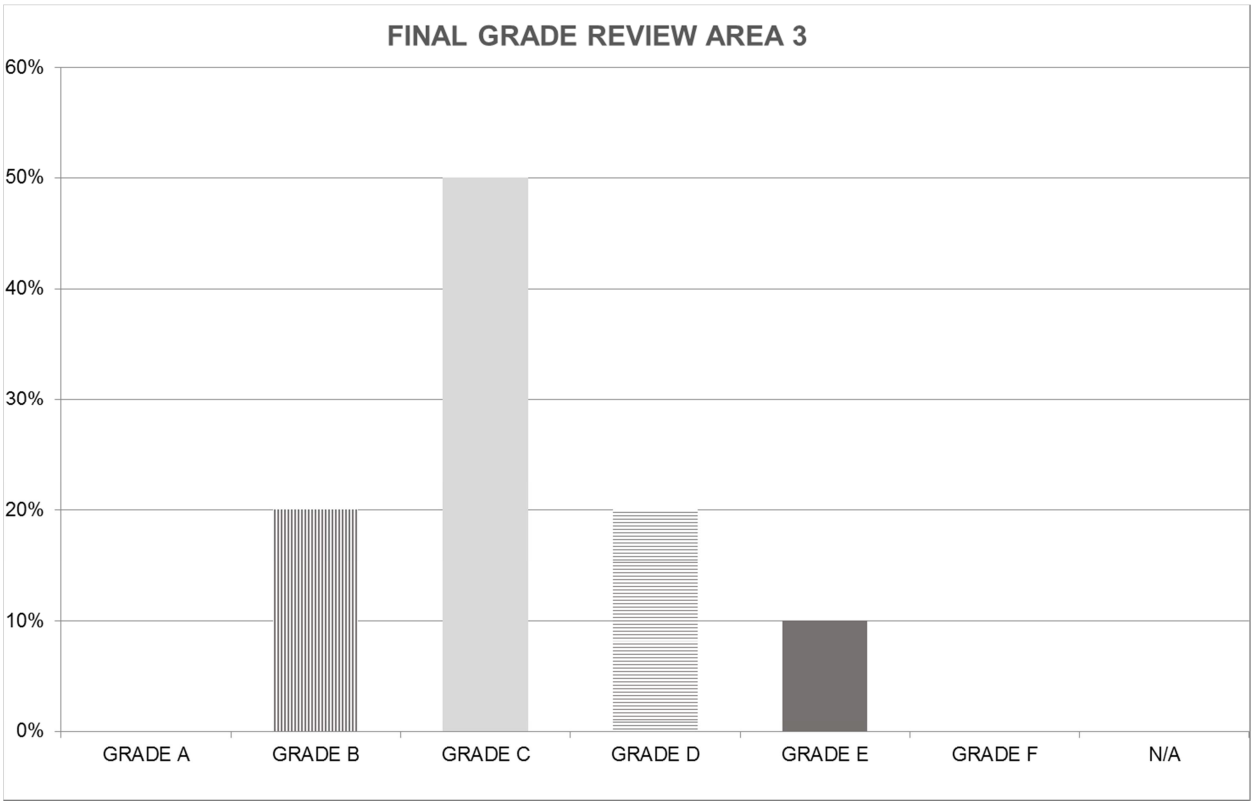

Figure 5-11: Grade for Review Area 3

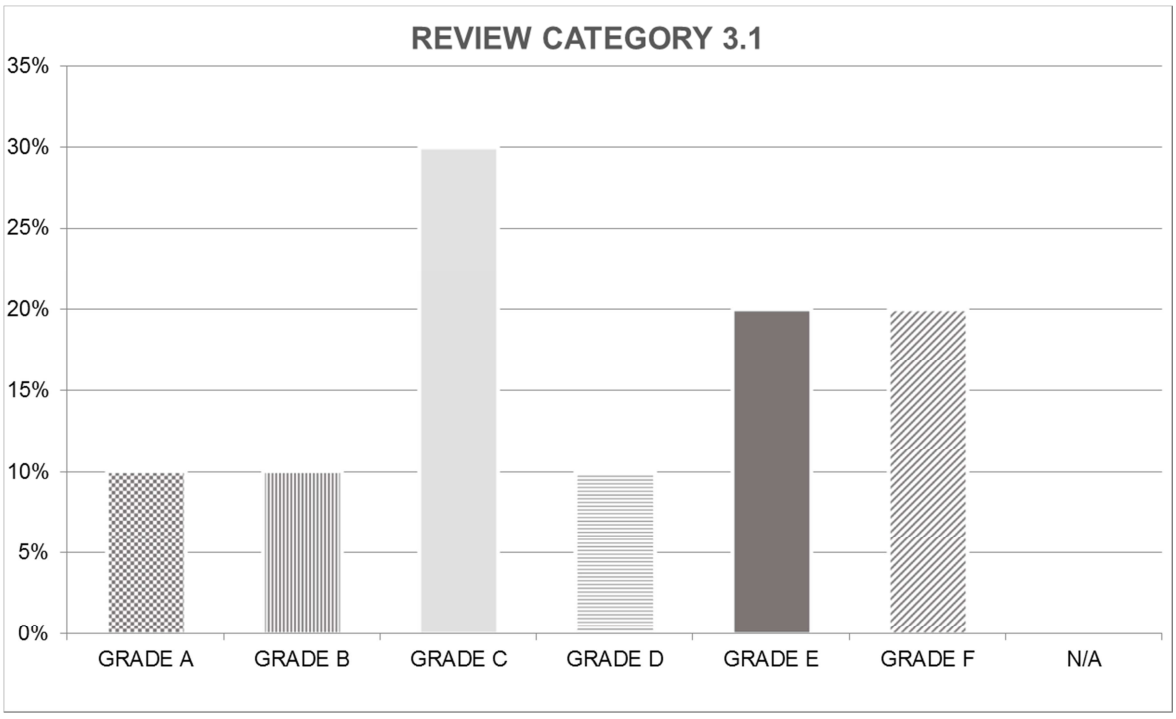

Figure 5-12: Grades for Review Category 3.1

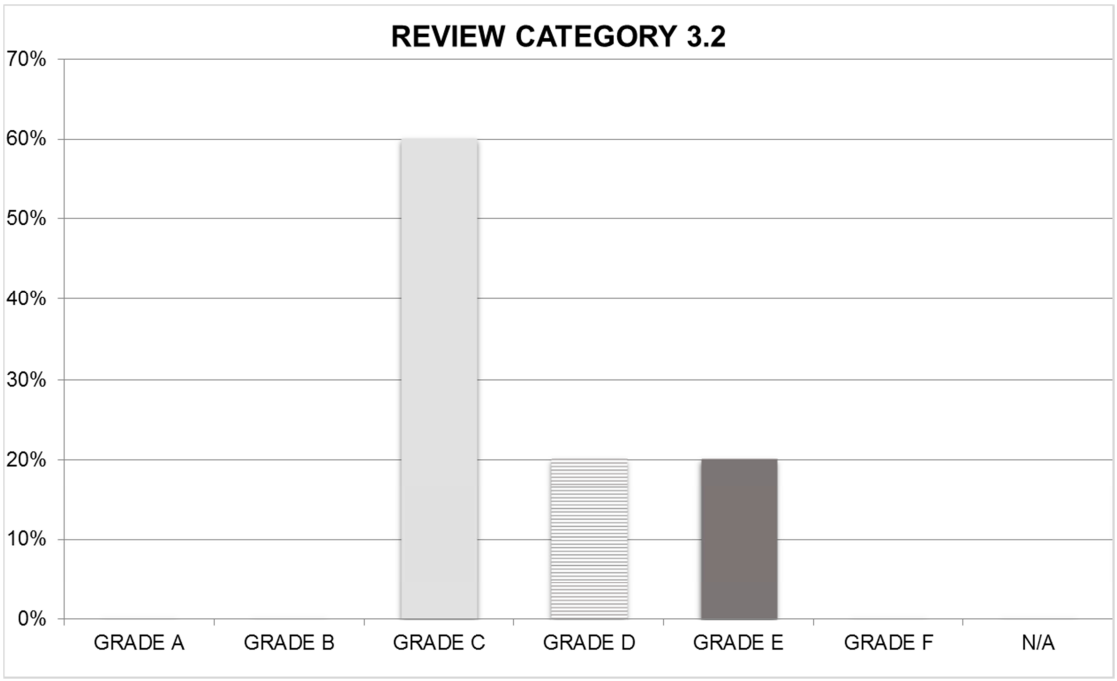

Figure 5-13: Grades for Review Category 3.2

For Review Category 3.3 (Commitment to Mitigation) 90% of the review sample was rated as Well Performed (Grade A). Review Category 3.3 (Commitment to Mitigation) was the best-performed review category in Review Area 3.

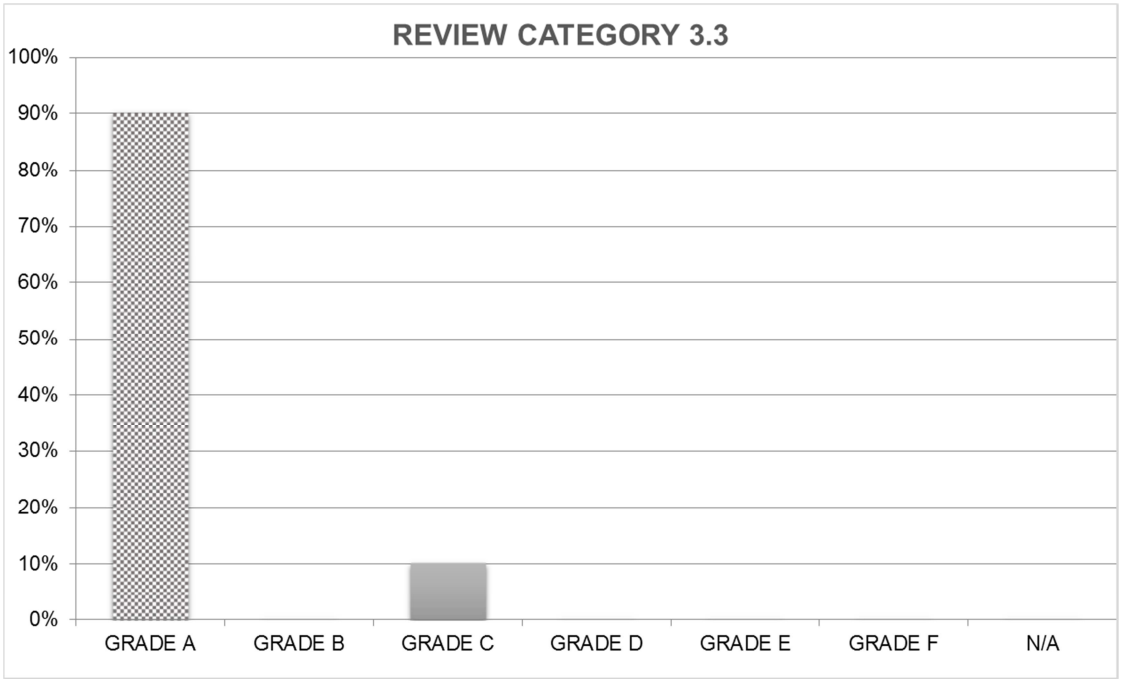

Figure 5-14: Grades for Review Category 3.3

5.5 Analysis of Review Area 4

Review Area 4 largely concerns the “cosmetic” presentation of the reports. Although previous studies revealed that Review Area 4 is usually “*one of the better performed review areas*” (Badr *et.al.,* 2011:282) only 50% of the EIAs were graded as Satisfactory (see Figure 5-15), while none of the reviewed reports were graded as Well Done.

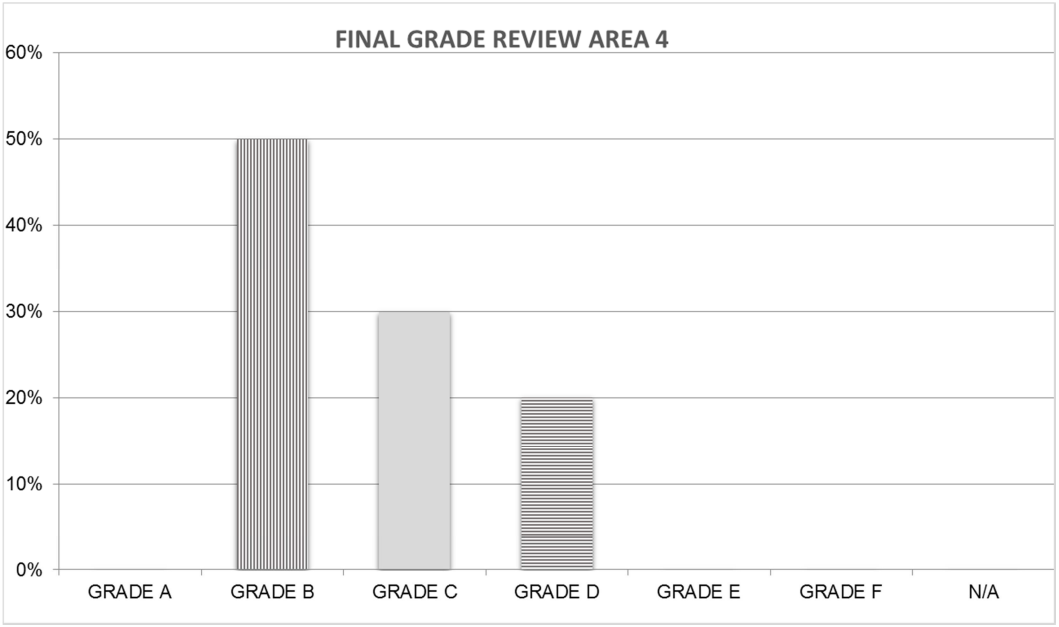

Figure 5-15: Grades for Review Category 4

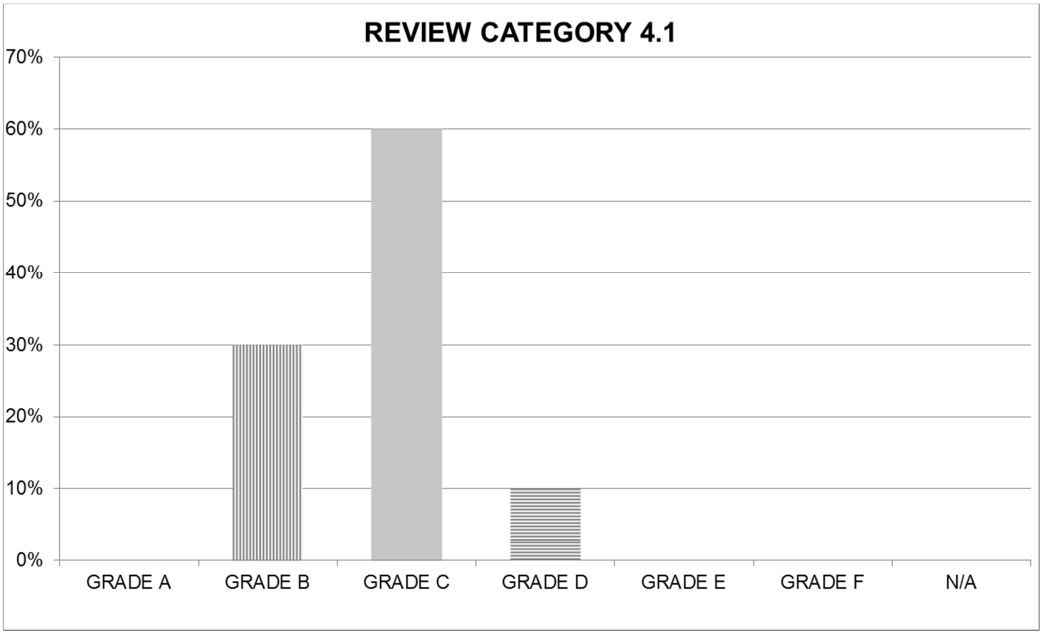

Figure 5-16: Grades for Review Category 4.1

The best performing Review Category was the Presentation (Review Category 4.2) for which 50% of the review sample was graded as Well Performed (Grade A) (see Figure 5-17).

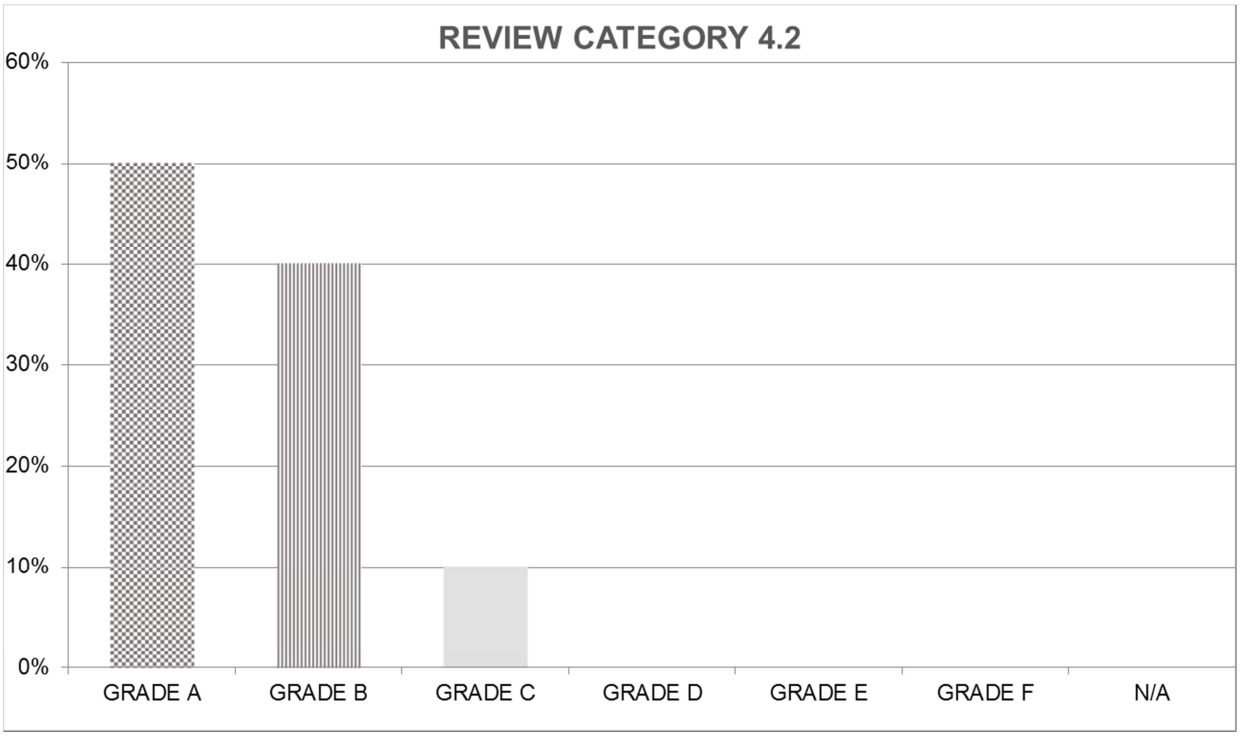

Figure 5-17: Analysis of Review Category 4.2

The Review Categories which performed the poorest were Review Category 4.3 (Emphasis) (see Figure 5-19) and Review Category 4.4 (Non-Technical Summary). The tasks within these two review categories which performed the worst included the provision of references and opinion by the EAP (Sub- Category 4.4.3) regarding whether or not a Waste Management License should be granted was not provided.

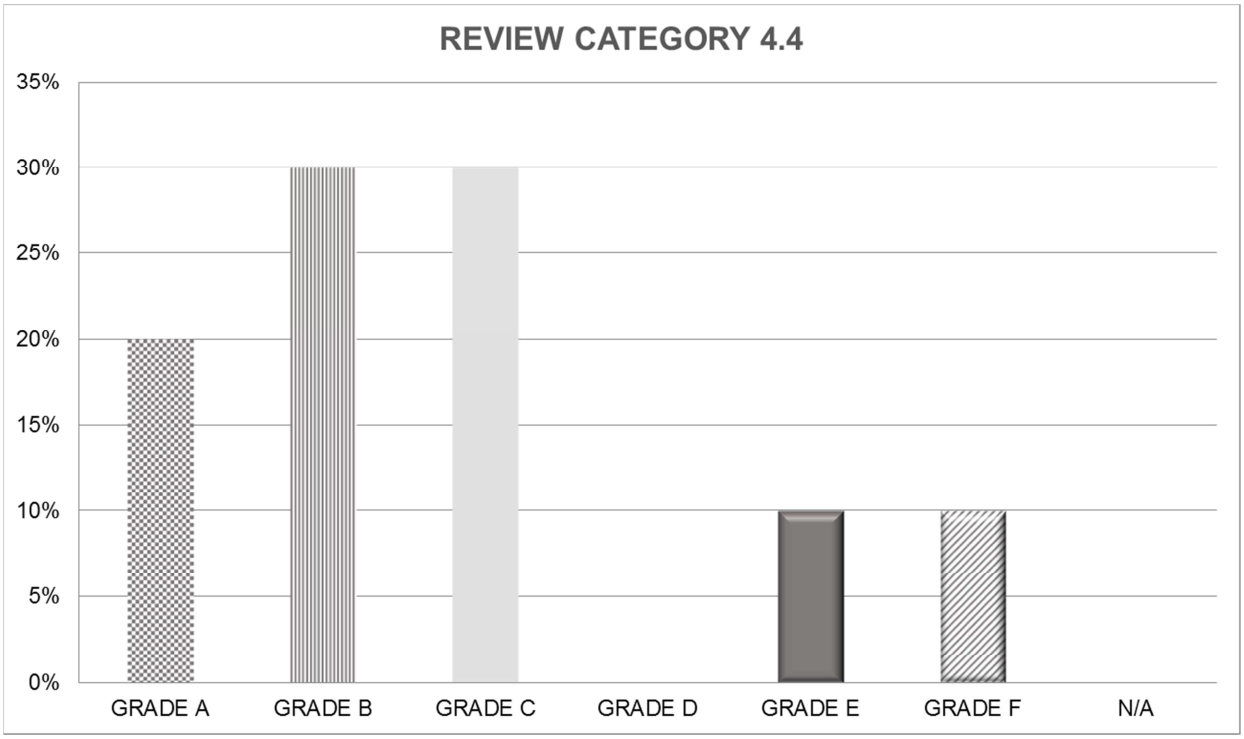

Figure 5-18: Grades for Review Category 4.3

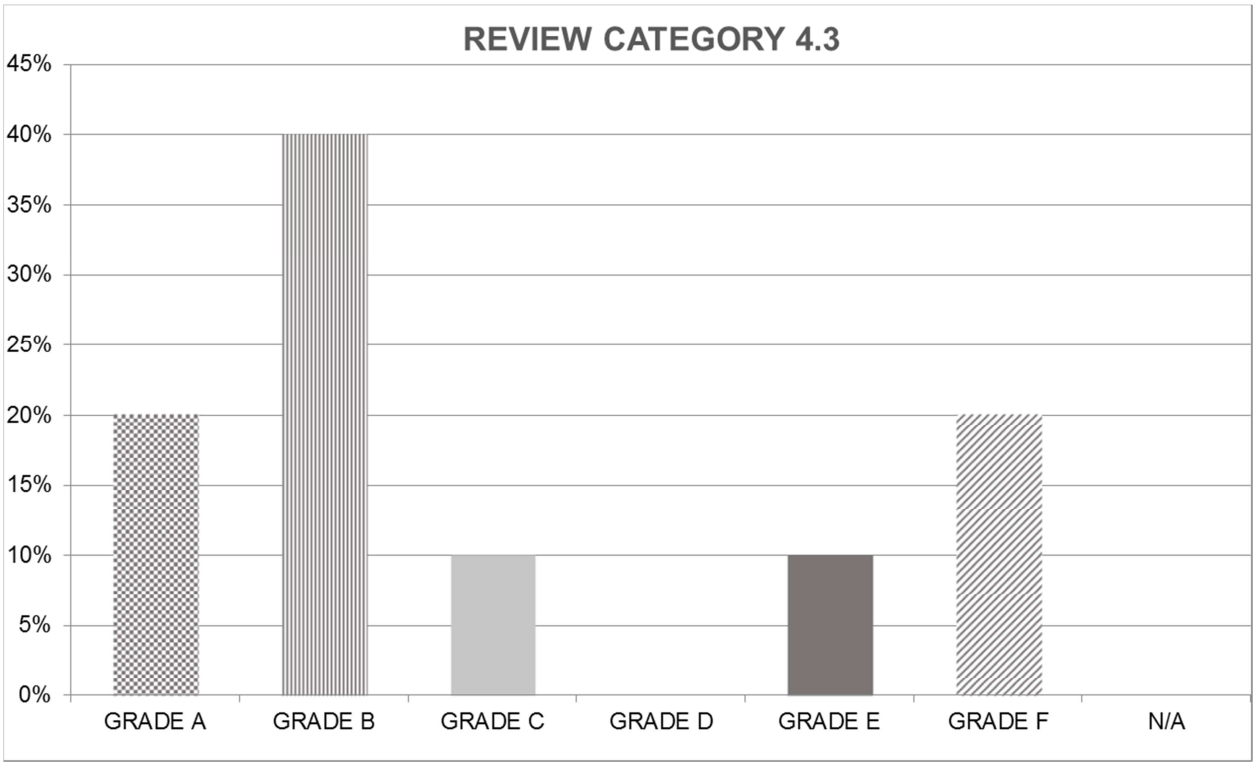

Figure 5-19: Grades for Review Category 4.3

5.6 Overall analysis of the four review categories

The overall assessment of the EIAs shows that 60% (refer to Figure 5-20) of the reports included in the review sample were graded as Just Satisfactory (Grade C). The remaining 40% of the sample was rated as being Satisfactory (Grade B). Although none of the reports included in the sample were graded as Well Performed (Grade A), no report was rated as unsatisfactory or poorly attempted.

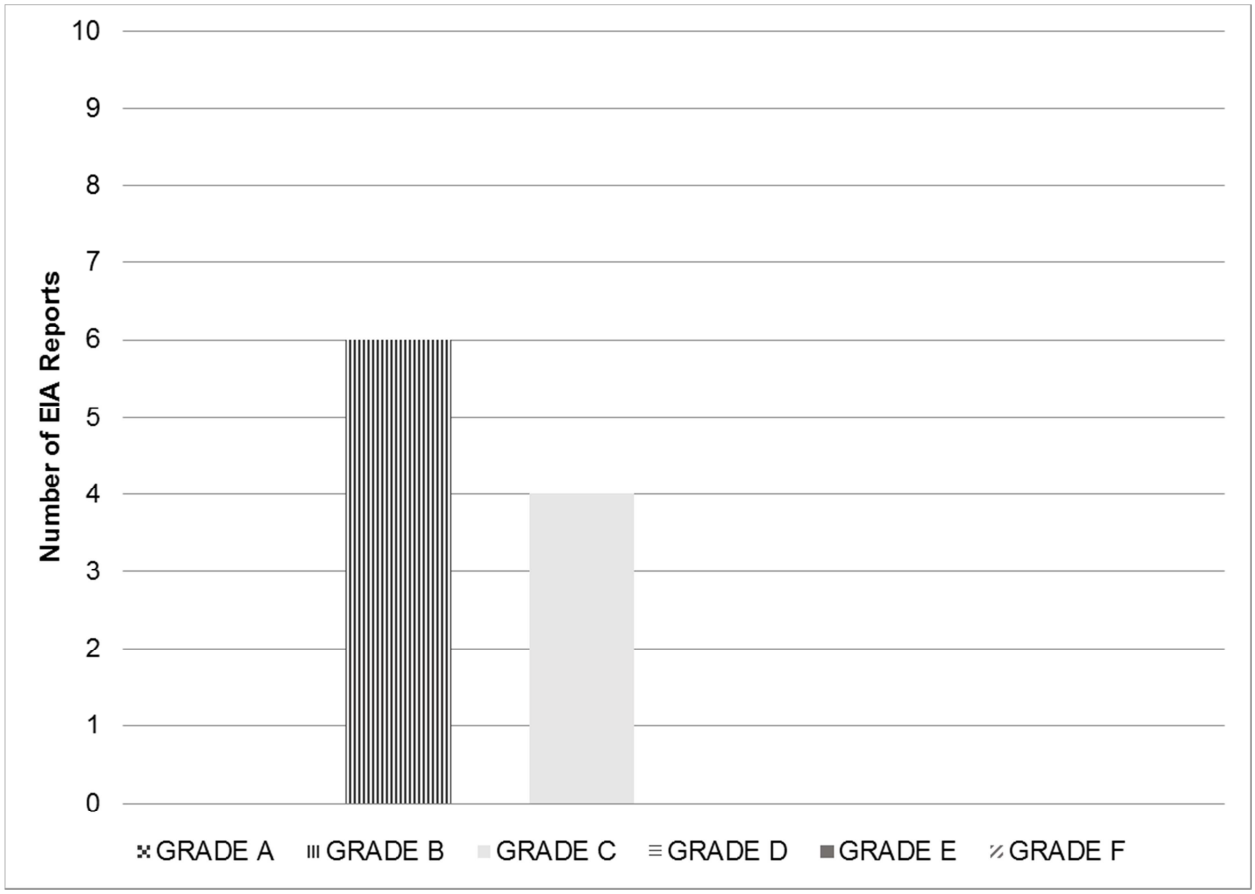

Figure 5-20: Overall rating of reports

5.7 Strengths and Weaknesses

In keeping with the approach adopted by Sandham et al. (2008[e]:236) the percentage A and B grades were calculated for strengths, and percentage E and F grades for weakness (see Table 5-3). The following categories having a proportion of A–B grades over 50% that could be regarded as strengths:

- Review Category 1.1: Description of the development;
- Review Category 1.3: Description of waste;
- Review Category 1.4: Environment Description;
- Review Category 2.1: Definition of impacts;
- Review Category 2.2: Identification of impacts;
- Review Category 2.4: Prediction of Impact Magnitude;
- Review Category 3.3: Commitment to mitigation
- Review Category 4.2: Presentation; and
- Review Category 4.3: Emphasis.

Table 5-3: Overview of the results of quality review of a sample of 10 EIA Reports per category

Summary of category grades		A	B	C	D	E	F	N/A	%A-B	%C-D	%E-F
1.1	Description of the development	1	4	4	0	1	0	0	50	40	10
1.2	Site Description	0	1	5	1	3	0	0	10	60	30
1.3	Description of waste	3	2	3	1	1	0	0	50	40	10
1.4	Environment Description	6	2	2	0	0	0	0	80	20	0
1.5	Baseline Conditions	0	4	4	0	0	2	0	40	40	20
2.1	Definition of impacts	1	4	3	2	0	0	0	50	50	0
2.2	Identification of impacts	7	2	0	0	0	1	0	90	0	10
2.3.	Scoping	3	1	2	3	1	0	0	40	50	10
2.4	Prediction of Impact Magnitude	2	6	2	0	0	0	0	80	20	0
2.5.	Assessment of Impact Significance	0	1	7	0	1	1	0	10	70	20
3.1.	Alternatives	1	1	3	1	2	2	0	20	40	40
3.2	Scope and effectiveness of mitigation measures	0	0	6	2	2	0	0	0	80	20
3.3	Commitment to mitigation	9	0	1	0	0	0	0	90	10	0
4.1	Layout of the report	0	3	6	1	0	0	0	30	70	0
4.2	Presentation	5	4	1	0	0	0	0	90	10	0
4.3	Emphasis	2	3	3	0	1	1	0	50	30	20

Areas of particular strength included the identification of impacts (Review Category 2.2), commitment to mitigation (Review Category 3.3) and the presentation of the EIA Report (Review Categories), each of the categories having a proportion of A–B grades of 90%. Although none of the categories had a proportion of E–F grades over 50%, the site description (Review Category 1.2) and alternatives (Review Category 3.1) indicate seemingly areas of weakness with the highest percentage of E-F grades, 30% and 40% respectively.

Table 5-4: Overview of the results of quality review of a sample of 10 EIA Reports per review area

Summary of review area grades		A	B	C	D	E	F	N	%A-B	%C-D	%E-F
1.	Description of the development	0	5	4	1	0	0	0	50	50	0
2.	Identification and evaluation of key impacts	0	5	4	1	0	0	0	50	50	0
3.	Alternatives and mitigation	0	2	5	2	1	0	0	20	70	10
4.	Communication of results	0	5	3	2	0	0	0	50	50	0

The A–B percentages show that the areas of strength include Review Area 1, 2 and Review Area 4. For Review Area 3 only 20% of the EIA Reports included in the sample were graded as Satisfactory (Grade B), whereas 50% were graded as Satisfactory for Review Area 1 and Review Area 2 (see Figure 5-21 and Table 5-4). With the exception of commitment to mitigation (Review Category 3.3) tasks concerning the alternatives (Review Category 3.1), and scope and

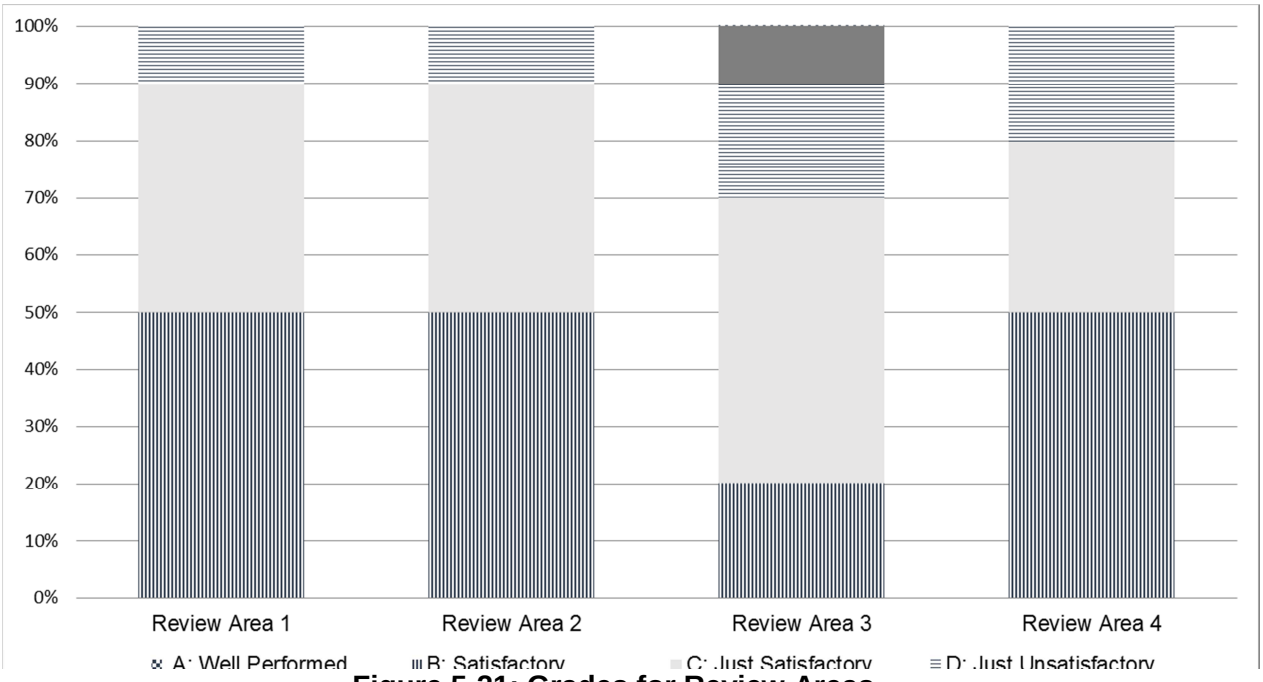

Figure 5-21: Grades for Review Areas

effectiveness of mitigation measures were performed less well.

6 CONCLUSION

This chapter serves to provide a concise overview of the key findings of the study in relation to the aims and objectives of the study. Recommendations and observed trends relating to the subject matter are also provided.

6.1 Main conclusion

This study was intended to achieve the following objectives:

1. To evaluate the quality of a sample of EIA Reports that have been prepared in support of Waste Management License Applications;
2. To establish a baseline against which to measure subsequent EIA Reports that are prepared in support of Waste Management License Applications; and
3. To determine common areas in terms of the substance of the EIA Reports which require improvement.

Although none of the reports included in the review sample was graded as Well Performed, no reports were deemed as unsatisfactory. This suggests that EIA Reports that are prepared in support of Waste Management License Applications are of satisfactory quality. Overall trends observed indicated that the areas which performed better could be indicative of the aspects on which the most emphasis is placed. Less effort is therefore thought to be placed on ensuring that the environmental implications associated with the WMAs are carried through the EIA Process. When comparing the findings of this study with other sectoral studies that have been done to determine the quality of EIA Reports, reports which have been prepared in support of WMLAs seemed to perform poorer.

6.2 Strengths and weaknesses

Similar to the approach adopted by Sandham *et al*., (2013[f]) the grades given to each review area signalled particular strengths and weaknesses of the reports by "*considering categories and sub-categories containing the highest proportion of A and B grades as strengths and those with the highest proportion of E and F grades as weaknesses*". A summary of research results of quality of Waste Management License EIA Reports is provided in Table 6-1.

Table 6-1: Summary of research results of Waste Management License EIA Reports

Review Area	Strengths	Weakness
Review Area 1: Description of project and receiving environment	• Description of receiving environment is main area of strength.	• Purpose and objectives of the Waste Management Activity/ies not consistently explained in detail; • Need and Desirability often expressed as motivation for planned activities; • Hierarchy of waste management practices poorly adopted; • Justification for disposal of waste not always indicated; • Waste Classification seldom carried out; and • No consideration is given to impacts which may occur as a result of non-standard operating conditions; and • Activities associated with each life-cycle phase of the WMAs not explicitly provided.
Review Area 2: Identification and assessment of key impacts	• Steps taken to obtain comments and input from I&APs were generally well addressed.	• Key impacts likely to emanate from implantation of WMAs not clearly described; • Outcome of Scoping Process not clearly transferred to EIA Phase;

Review Area	Strengths	Weakness
		• Comparative analysis of alternatives seldom provided; and • Generally, mitigation measures and commitment to implementation thereof was sufficiently addressed.
Review Area 3: Alternatives and mitigation	• Generally mitigation measures and commitment to implementation thereof was sufficiently addressed.	• Comparative analysis of alternatives seldom provided.
Review Area 4: Communication of results	• Presentation of information (i.e. "cosmetic appearance") main area of strength.	• EAP opinion often not provided; • Key impacts not accentuated; and • References seldom provided.

6.2.1 Strengths

Categories greatest proportion of A-grades was obtained for Review Category 2.2 (70%), Review Category 3.3 (90%) and Review Category 4.2 (50%). The impact assessment methodologies were generally comprehensively described, although omission noted included explicit reference to level of confidence relating to the significance assigned to the impacts. Furthermore, a clear distinction between impact magnitude and impact significance was not always apparent, nor was the reversibility indicated. It should however be noted that although the NEMA EIA Regulations 2014, specifies the aspects (nature, significance, consequence, extent, duration and probability of the impacts) to be included in the assessment of the impacts, no universal impact assessment methodology has been developed or legislated. EAPs are therefore left to develop and apply assessment methodologies to the best of their ability.

The various role players responsible for the implementation of mitigation measures was very well addressed, with 90% of the review sample graded as Well Performed. The EMPr appended to the EIA Report made provision and clearly indicated the roles and responsibilities of those responsible for the implementation of the provisions made in the EMPr.

The description of the receiving environment is also considered a strength as 60% of the review sample was rated as Well Performed (Grade A). It should however be noted that the link between the specialist studies' findings and the environmental description should be improved upon.

6.2.2 Weaknesses

The worst performing Categories included Category 3.1 (Alternatives) for which 50% of the review sample received D-F ratings as well as Category 2.3 (Scoping) of which 40% was received D-E grades. With regards to Scoping, in the case where the Scoping Process does not generate key areas on which focus should be placed during the EIA Phase, the EIA Report largely becomes just a "Bulkier" Scoping Report with additional information. This also leads to a case where mostly generic impacts are assessed, as opposed to significant impact relating specifically to the WMAs and associated activities. It appears that information relating to key impacts gets "lost in translation".

6.3 Recommendations

Emanating from the results which were obtained, the following recommendations are made to bring Waste Management Licenses on par with both best practice standards and legal requirements:

- In the case where an integrated EIA Report (for both NEMA EIA Listed Activities and listed WMAs) are collated a clear distinction should be made between the NEMA and WMAs;
- Impacts that are assessed should be specific to the implementation of activities associated with the WMAs;
- Officials provincial and national Department of Environmental Affairs should endeavour to adopt a systematic review approach in determining the quality of the EIA Reports which are prepared in support of WMLAs using the amended Review Package which have been used for this study;

- Existing guidelines published by the National Department of Environmental Affairs should be revised to place greater emphasis on the link between the application of the hierarchy of waste management practices, mitigation hierarchy and the consideration of alternatives;
- Environmental Assessment Practitioners, assess EIAs prepared for WMLAs against the requirements laid down in the Review Checklist developed as part of this study; and
- Key impacts identified during the Scoping Phase should be explicitly indicated in the succeeding EIA Report.

6.4 Conclusion

It can be concluded from the results obtained from this study that the larger portion of EIA Reports which were included in the Review Sample was of satisfactory quality, according to the Amended Review Package. Although Review Areas 1 (Description of the development) , Review Area 2 (Identification and evaluation of key impacts), and Review Area 3 (Alternatives and Mitigation) on average were better performed than Review Area 4 (Communication of Results) there are certain aspects within each of the Review Areas that require improvement and be considered problematic. As the purpose of this study was focussed on WMLA EIA Reports areas of concern relate mostly to the application of the Waste Management Hierarchy and the comparative assessment of all alternatives identified, which if applied could contribute greatly to preventing impacts from occurring. The recommendations provided in Section 6.3 will assist with addressing the aforesaid areas of concern to bring Waste Management Licenses on par with both best practice standards and legal requirements.

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APPENDIX A: REVIEW PACKAGE COLLATION SHEET

Sub Category		Well performed, no important tasks left	Satisfactory, only minor omissions	Just satisfactory despite omm and/or inad	Just unsatisfactory because of omm/inad	Not satisfactory, significant omm or inad	Very unsatisfactory, important tasks poorly done/not attempted	Not Applicable
Review Area 1 DESCRIPTION OF THE DEVELOPMENT, LOCAL ENVIRONMENT AND BASELINE CONDITIONS		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
1.1 DESCRIPTION OF THE DEVELOPMENT								
1.1.1	Purpose and objectives of Waste Management Activity/ies							
	Purpose							
	Objectives							
	Need and desirability of proposed Waste Management Activity/ies							
1.1.2	Design and size of development							
	Description of all facility/ies associated with the Waste Management Activity /ies							
	Diagrams, plans, maps included							
1.1.3	Physical presence and appearance of completed development within receiving environment							
	Indication thereof							
1.1.4	Visual depiction of planned Waste Management Activity/ies							
	Illustration of the process/ses associated with the Waste Management Activity/ies							
	Waste types and quantities associated with planned activities							
1.1.5	Nature and quantity of raw materials needed during different phases							
	Construction phase: Nature of raw materials							
	Quantity of raw materials							
	Operational phase: Nature of raw materials							
	Quantity of raw materials							
1.1.6	Waste Management Hierarchy							
	Indication of application							
1.1.7	Identification of applicant							
	Name							
	Address and contact numbers							
1.1.8	Details of EAP carrying out environmental impact assessment							
	Declaration of independence							
	Expertise of EAP							
PRELIMINARY GRADE – REVIEW AREA 1.1								
Review Area 1		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
1.2 SITE DESCRIPTION: On site land requirements of development and duration of each land use								
1.2.1	Footprint of Waste Management Activity/ies							
	Extent of waste management activities mapped in relation to environmentally sensitive areas must be mapped							
	Description of property/ies associated with WMAs							

Sub Category		Well performed, no important tasks left	Satisfactory, only minor omissions	Just satisfactory despite omm and/or inad	Just unsatisfactory because of omm/inad	Not satisfactory, significant omm or inad	Very unsatisfactory, important tasks poorly done/not attempted	Not Applicable
1.2.2	Description of demarcation of Land use areas							
	Description of land uses to which this land will be put							
	Demarcation of different land use areas							
1.2.3	Estimated duration of different phases							
	Construction phase							
	Operational phase							
	Decommissioning phase (where appropriate)							
1.2.4	Estimated number of workers and/or visitors entering development site, access to site and likely means of transport							
	Number of workers: Construction phase							
	Operational phase							
	Number of visitors: Construction phase							
	Production phase							
1.2.5	Means of transporting raw materials/products to and from site and approximate quantities involved							
	Means of transporting							
	Approximate quantities							
PRELIMINARY GRADE – REVIEW AREA 1.2								
Review Area 1		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
1.3 WASTES: Estimated types and quantities of wastes which might be produced and proposed disposal routes to the environment described								
1.3.1	Description of all waste types to be generated and anticipated waste volumes							
	Waste Types							
	Waste Volumes for each phase of project lifecycle							
1.3.2	Proposed handling/treatment, disposal and disposal routes to the environment							
	Handling							
	Treating							
	Disposal							
1.3.3	Methods of obtaining quantity of residuals and wastes							
	Methods of obtaining quantity of wastes							
	Uncertainty acknowledged							
	Confidence limits given (where possible)							
PRELIMINARY GRADE – REVIEW AREA 1.3								
Review Area 1		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
1.4 ENVIRONMENT DESCRIPTION: Area and location likely to be affected by development proposal								
1.4.1	Indication of likely area to be affected by development							
	Description of direct environment to be affected							

Sub Category		Well performed, no important tasks left	Satisfactory, only minor omissions	Just satisfactory despite omm and/or inad	Just unsatisfactory because of omm/inad	Not satisfactory, significant omm or inad	Very unsatisfactory, important tasks poorly done/not attempted	Not Applicable
	Map with location shown							
1.4.2	Greater area to accommodate potentially significant effects occurring away from immediate affected environment							
	Dispersion of pollutants							
	Infrastructural requirements of project							
	Traffic							
PRELIMINARY GRADE – REVIEW AREA 1.4								
Review Area 1		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
1.5 BASELINE CONDITIONS: Description of effected environment as it is currently, and as it could be expected to develop if project were not to be proceed.								
1.5.1	Identification and description of important components of the affected environment							
	Disclosure of methods and investigation undertaken							
	Size and complexity in relation to assessment task							
	Assumptions, uncertainties and knowledge gaps							
1.5.2	Existing data sources searched and utilized							
	Local authority records							
	Special studies carried out by/on behalf of conservation agencies/special interest groups							
1.5.3	Local land use plans, policies consulted and other data collected to determine baseline conditions							
	Future state of environment – no go action							
	Implications associated with change of land-use addressed							
PRELIMINARY GRADE – REVIEW AREA 1.5								
SUMMARY OF PRELIMINARY GRADES – REVIEW AREA 1		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
1.1	**Description of environment**							
1.2	**Site description**							
1.3	**Waste**							
1.4	**Environment description**							
1.5	**Baseline condition**							
FINAL GRADE REVIEW AREA 1								
Review Area 2 IDENTIFICATION AND EVALUATION OF KEY IMPACTS		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
2.1 DEFINITION OF IMPACTS: Potential impacts of development on the environment								
2.1.1	Description of all possible effects of project on environment							
	Direct							
	Indirect							
	Secondary							
	Cumulative							

Sub Category		Well performed, no important tasks left	Satisfactory, only minor omissions	Just satisfactory despite omm and/or inad	Just unsatisfactory because of omm/inad	Not satisfactory, significant omm or inad	Very unsatisfactory, important tasks poorly done/not attempted	Not Applicable
	Short term							
	Medium term							
	Long term							
	Permanent							
	Temporary							
	Positive							
	Negative							
2.1.2	Identify and describe the effects and interaction of effects on environment							
	Human beings							
	Flora and fauna							
	Soils							
	Water							
	Air							
	Climate							
	Landscape (Aesthetics)							
	Material assets							
	Cultural heritage							
	Architectural heritage							
	Archaeological heritage							
2.1.3	Impacts arising from non-standard operating conditions							
	Description of the likelihood and consequences of the Waste Management Activity/ies on receiving environment, in the absence management measures							
	Accidents							
	Adverse weather							
2.1.4	Impacts arising from deviation from baseline conditions							
	Difference between conditions if development were not to proceed							
	Those predicted to prevail as a consequence of it							
PRELIMINARY GRADE – REVIEW AREA 2.1								
Review Area 2		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
2.2 IDENTIFICATION OF IMPACTS: Methods used for identification of all significant impacts								
2.2.1	Impact identification methodology							
	Project specific checklist							
	Matrices							
	Panels of experts							
	Consultation							
	Supplementary methods to identify secondary impacts							
2.2.2	Description of impacts identification methods							
	Method							

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	Rational for using them							
PRELIMINARY GRADE – REVIEW AREA 2.2								
Review Area 2		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
2.3 SCOPING: Key impacts should be identified, and main investigation centred on these.								
2.3.1	Genuine attempt to contact general public and special interest groups to appraise them of project							
	Description of the advertisement							
	Notification: Relevant provincial gazette							
	Newspaper (local, regional, national)							
	Site							
	Advertisement of public meeting							
	Notification of availability of EIA report							
2.3.2	Arrangements to collect opinions and concerns of I&APs							
	Steps undertaken in accordance with plan of study							
	List of identified I&APs:							
	General public							
	Special interest groups							
	Government and public agencies							
	Arrangements made to collect opinions: public meeting, seminar, discussion group, etc.							
	List of registered I&APs:							
	Summary of comments received							
	Summary of issues raised							
	Date of receipt of comments							
	Response of EAP							
	Copies of any representations, objections and comments received from registered I&APs							
2.3.3	Key impacts							
	Identified and selected for intense investigation							
	Reasons why less important impacts require less detailed investigation							
	Summary of the findings and recommendations of any specialist report							
PRELIMINARY GRADE – REVIEW AREA 2.3								
Review Area 2		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
2.4 PREDICTION OF IMPACT MAGNITUDE: Likely impacts should be described in exact terms where possible								
2.4.1	Data used to estimate magnitude of main impacts and gaps in data clearly indicated							
	Should be sufficient for task							

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	Should be clearly described or sources clearly identified							
	Gaps in data should be clearly identified							
	Means used to deal with gaps in data should be explained.							
2.4.2	Methods predicting impact magnitude clearly described							
	Methods used clearly described							
	Methods appropriate to size and importance of projected impact							
2.4.3	Express predictions of impact in measurable quantities with confidence limits							
	Measurable quantities							
	Qualitative descriptions should be fully defined							
PRELIMINARY GRADE – REVIEW AREA 2.4								
Review Area 2		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
2.5 ASSESSMENT OF IMPACT SIGNIFICANCE: Estimation of expected significance of impacts for society								
2.5.1	Description of significance of impacts on affected community and society in general							
	Described							
	Distinguished from impact magnitude							
	Indication of: Degree to which the impact can be mitigated							
	Degree to which impact can be reversed							
	Degree to which impact may cause irreplaceable loss of resources							
	Significance of impact remaining after mitigation described							
2.5.2	Significance of impacts in terms of national and international quality standards							
	Assessed							
	Accounts taken of nature, duration, intensity, extent and probability of impacts in conjunction with national and local societal values							
2.5.3	Justification of proposed method of assessing significance							
	Indication of methodology used							
	Choice of standards, assumptions and value systems							
	Contrary opinions summarized							
PRELIMINARY GRADE – REVIEW AREA 2.5								
SUMMARY OF PRELIMINARY GRADES – REVIEW AREA 2		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
2.1	Definition of impacts							
2.2	Identification of impacts							
2.3	Scoping							
2.4	Prediction of impact magnitude							
2.5	Assessment of impact significance							

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FINAL GRADE REVIEW AREA 2								
Review Area 3 ALTERNATIVES AND MITIGATION		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
3.1 ALTERNATIVES: Feasible alternatives should be considered								
3.1.1	Consideration/description of alternative sites							
	Description of method applied to identify alternatives							
	Main environmental advantages							
	Main environmental disadvantages							
	Reasons for final choice							
	Environmental implications investigated and reported							
3.1.2	Consideration/description of alternative processes, designs and operating conditions							
	Environmental implications investigated and reported							
3.1.3	For unexpectedly severe adverse impacts identified							
	Earlier rejected alternatives re-appraised							
3.1.4	Comparative assessment of all alternatives identified							
	Comparative assessment of all alternatives identified							
PRELIMINARY GRADE – REVIEW AREA 3.1								
Review Area 3		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
3.2 SCOPE AND EFFECTIVENESS OF MITIGATION MEASURES: All significant adverse impacts should be considered for mitigation.								
3.2.1	Consider mitigation of all significant adverse impacts							
	Mitigation of al significant impacts considered							
	Specific mitigation measures put forward							
	Unmitigated impacts indicated and justified							
3.2.2	Mitigation measures considered should include							
	Modification of project							
	Alternative facilities							
	Pollution control							
3.2.3	Extent of effectiveness of mitigation when implemented							
	Expected effectiveness							
	Description of uncertainty, assumptions, gaps in knowledge							
PRELIMINARY GRADE – REVIEW AREA 3.2								
Review area 3		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
3.3 COMMITMENT TO MITIGATION								
3.3.1	Clear record of commitment of developer to mitigation measures							
	Presented in report							
	Details of how mitigation measures will be implemented							

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	Draft EMP must comply with regulations							
	Any specific information required by competent authority							
3.3.2	Monitoring arrangements should be proposed in draft EMP							
	Monitoring arrangements to correspond with scale and deviations form expected impacts							
	Provisions to adjust mitigation measures							
PRELIMANARY GRADE – REVIEW AREA 3.3								

SUMMARY OF PRELIMINARY GRADES – REVIEW AREA 3		**A**	**B**	**C**	**D**	**E**	**F**
3.1	Feasible alternatives should have been considered						
3.2	Scope and effectiveness of mitigation measures						
3.3	Commitment to mitigation						
FINAL GRADE REVIEW AREA 3							

Review Area 4 COMMUNICATION OF RESULTS		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
4.1 LAYOUT OF THE REPORT								
4.1.1	Introduction							
	Briefly describing the project activities associated with Waste Management Activity /ies							
	The aims of the environmental assessment							
	How aims are to be achieved							
4.1.2	Best Practicable Environmental Option							
	Adoption of BEO relating to Waste Management Activity/ies must be described.							
4.1.3	Arrangement of information							
	Logically in sections/chapters							
	Whereabouts of important data signalled in a table of contents or index.							
4.1.4	Unless chapters are very short							
	Chapter summaries to outline main findings of each phase							
4.1.5	External sources referenced							
	Original source must be acknowledged at that point in text and reference							
	Full reference should be included							
PRELIMINARY GRADE – REVIEW AREA 4.1					✓			

Review Area 4		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
4.2 PRESENTATION: Information should be accessible to the non-specialist								
4.2.1	Presentation of Information							
	Comprehensible to non-specialist							
	Appropriate tables, graphs and other devices							

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	Unnecessary technical language avoided							
	Unnecessary obscure language avoided							
4.2.2	Technical terms, acronyms, initials defined							
	When first used in text or in glossary							
4.2.3	Statement presented as an integrated whole							
	Summaries of data presented in separately appendices should be introduced in main body of text							
PRELIMINARY GRADE – REVIEW AREA 4.2								
Review Area 4		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
4.3 EMPHASIS: Information should be represented without bias								
4.3.1	Prominence and emphasis to potentially severe impacts							
	Potentially severe and adverse impacts							
	Potentially substantially favourable environmental impacts							
4.3.2	Statement must be unbiased							
	Should not lobby for any particular pint of view							
	Adverse impacts should not be disguised by euphemism or platitudes							
4.3.3	Opinion as to whether the activity should/should not be authorized							
	Opinion as to whether the activity should/should not be authorized							
PRELIMINARY GRADE – REVIEW AREA 4.3								
Review Area 4		**A**	**B**	**C**	**D**	**E**	**F**	**N/A**
4.4 NON-TECHNICAL SUMMARY: Clearly written non-technical summary of main findings								
4.4.1	Non-technical summary of main findings and conclusions							
	Potentially severe and adverse impacts							
	Potentially substantially favourable environmental impacts							
	Technical terms, lists of data, detailed explanations, scientific reasoning should be avoided.							
4.4.2	Summary must cover all main issues							
	Description of project and environment							
	Main mitigation measures to be undertaken							
	Description of significant residual impacts							
	Methods by which data were obtained							
	Indication of confidence in methods to obtain data							
4.4.3	EAP Opinion							
	Reasoned opinion as to whether the proposed Waste Management Activity/ies should or should not be authorised							
	Condition recommended to be included in Waste Management License (if granted)							

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PRELIMINARY GRADE – REVIEW AREA 4.4								
SUMMARY OF PRELIMINARY GRADES – REVIEW AREA 4		**A**	**B**	**C**	**D**	**E**	**F**	
4.1	Layout of the report							
4.2	Presentation							
4.3	Emphasis							
4.4	Non-Technical Summary							
FINAL GRADE REVIEW AREA 4								
SUMMARY OF ALL REVIEW AREAS		**A**	**B**	**C**	**D**	**E**	**F**	
1	Description of project							
2	Identification and Development of key impacts							
3	Alternatives and Mitigation							
4	Communication of results							
FINAL GRADE REVIEW FOR EIA								