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**NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998
(ACT NO. 107 OF 1998)**

**PUBLICATION OF ENVIRONMENTAL MANAGEMENT FRAMEWORK GUIDELINE FOR
IMPLEMENTATION**

I, Bomo Edith Edna Molewa, the Minister of Water and Environmental Affairs, hereby publish, in terms of section 24J of the National Environmental Management Act, 1998 (Act No. 107 of 1998) the Environmental Management Framework Guideline, in the schedule hereto.



BOMO EDITH EDNA MOLEWA

MINISTER OF WATER AND ENVIRONMENTAL AFFAIRS



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

INTEGRATED ENVIRONMENTAL MANAGEMENT GUIDELINE SERIES (GUIDELINE 6)

ENVIRONMENTAL MANAGEMENT FRAMEWORK REGULATIONS, 2010


ENVIRONMENTAL MANAGEMENT FRAMEWORKS: Guideline 6

Further titles in this series of guideline documents are being prepared and will be made available periodically. The sequence of release and titles are subject to change.

Guideline Series 1	Environmental Management Co-operation Agreements
Guideline Series 2	NEMA S24G (ECA applications)
Guideline Series 3	NEMA S24G
Guideline Series 4	Strategic Environmental Assessment
Guideline Series 5	Companion to the NEMA EIA Regulations 2010
Guideline Series 6	Environmental Management Framework
Guideline Series 7	Public Participation in the EIA process
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**ENVIRONMENTAL MANAGEMENT FRAMEWORKS: Guideline 6**

PREFACE

This document is one of the series of guideline documents on environmental impact management legislation and regulations.

The material in this document is intended to be used as an accompanying document to the NEMA EMF Regulations 2010; it makes available the content of the EMF regulations in laymen's terms.

**ENVIRONMENTAL MANAGEMENT FRAMEWORKS: Guideline 6****ACKNOWLEDGEMENTS**

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BACKGROUND

EMFs are part of the suite of integrated environmental management (IEM) tools that can be used to support informed decisions regarding the management of impacts on the environment that arise out of human activities and developments. In 2010, the Minister of Environmental Affairs passed the Environmental Management Framework Regulations, 2010 (EMF Regulations) in terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) which replaced the previous EMF provisions contained in the Environmental Impact Assessment Regulations, 2006.

The purpose of this document is to provide guidance on the compilation of EMFs in terms of the EMF Regulations. It draws on and updates the draft EMF Guidelines which were compiled in 2005 to support the Environmental Impact Assessment Regulations, 2006. While the principles and broad concept of EMFs are often understood, there is less understanding regarding the basic steps, technical processes, the methodology to be adopted, and structure of the final output of the EMF process. This guideline accordingly provides detailed information on the step-by-step process that is required, including the public participation process.


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**ENVIRONMENTAL MANAGEMENT FRAMEWORKS: Guideline 6****ABBREVIATIONS**

BID	Background information document
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DWA	Department of Water Affairs
EAP	Environmental assessment practitioner
ECA	Environment Conservation Act, Act No. 73 of 1989
EIA	Environmental impact assessment
EMF	Environmental management framework
GIS	Geographic information system
IDP	Integrated Development Plan
I&APs	Interested and affected parties
IEM	Integrated Environmental Management
LDO	Land Development Objective
MEC	Member of the Executive Committee
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
PPP	Public Participation Process



DEFINITIONS / GLOSSARY OF TERMS

Attributes

Environmental attributes means the quality ascribed to an element in the environment that distinguishes it in character, form or nature from other elements in the environment.

Categories

Categories relate to a larger grouping of similar, homogenous baseline information comprised of data features. Typical categories include hydrology, vegetation, geology, soils etc.

Constraint zones

Constraint zones refer to the spatial areas identified in the EMF which illustrate a specific environmental opportunity or constraint towards development pressure.

Management Guidelines

Management guidelines refer to the specific provisions applied in the management of each individual attribute or activity.

Environmental Management Framework (EMF)

The study of the biophysical and socio-cultural systems of a geographically defined area to reveal where specific land-uses may best be practiced and to offer performance standards for maintaining appropriate use of such land.

EMF Regulations

Environmental Management Framework Regulations, 2010 passed in terms of NEMA.

Facet Map

A facet map is also referred to as a 'spaghetti layer'. It is a GIS term to describe the sum and integration of all the baseline information into a single spatial layer.

Features

Features refer to the finer, individual environmental elements that comprise a data category, e.g. Hydrology – *rivers, streams, wetlands, dams, etc.*

Geographical Areas

A logical spatially demarcated area defined by an EMF as being sensitive, requiring specific management intervention to ensure its future environmental integrity.

Management Zones

Management zones refer to a specific demarcated geographical area, represented spatially on a map illustrating a specific sensitive feature which needs to be managed in a pro-active and dedicated way.

MEC

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Member of the Executive Committee to whom the Premier has assigned responsibility for environmental affairs.

Minister

Means the Minister of Water and Environmental Affairs.

Overlay Planning

A spatial planning approach whereby various multiple baseline data sets are overlaid, one on another, and unioned to provide a single facet map.

Project Steering Committee

The development of the EMF is overseen by a Project Steering Committee. The committee should be composed of, as a minimum, the initiator, relevant local, provincial and national regulatory authorities, and additional members with an expertise as deemed appropriate by the aforementioned.

'Spaghetti Layer'

A 'spaghetti layer' is also referred to as a 'facet map'. It is a GIS term to describe the sum and integration of all the baseline information into a single spatial layer.

Trigger / Driver

The trigger or driver is the potential or actual? impact or aspect which has led to the initiation of the EMF, e.g. mining pressure on endangered grassland vegetation types.

Unioned

A GIS term to describe the process of integrating multiple baseline spatial information layers into a single facet map.

**ENVIRONMENTAL MANAGEMENT FRAMEWORKS: Guideline 6****1. INTRODUCTION**

Within the context of the development of environmental legislation and associated provisions in South Africa, the environment, and specifically environmental sensitivity, was never adequately and directly integrated into impact management. One of the first attempts was made in the development of the Integrated Environmental Management Guideline Series published by the Department of Environmental Affairs and Tourism in 1992, whereas Guideline 5 made specific reference to sensitive environments. Although it was a step in the right direction the document was merely a guideline and not underpinned by any statutory provisions.

Through the DEAT Law Reform Process of 1997-1998, a major restructuring of South African framework environmental legislative provisions in the country was undertaken. The result was the drafting of the National Environmental Management Act, Act No.107 of 1998, commonly known as NEMA, which was earmarked to replace the Environment Conservation Act, Act No. 73 of 1989 (ECA) over time.

For the first time in South African environmental legislative history, provision was made for environments and specifically sensitive environments in framework legislation (Acts) through the provision for the development of environmental management frameworks.

In April 2006 the Minister of Environmental Affairs and Tourism passed regulations¹ in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). These regulations clearly stipulated the procedure and provisions for undertaking an environmental management framework (EMF). The regulations replaced the environmental impact assessment regulations which were promulgated in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989) in 1997 and introduced new provisions regarding environmental management frameworks.

The Department of Environmental Affairs (DEA) has produced a series of guidelines to assist potential applicants and interested and affected parties (I&APS) to understand what is required of them and what their role may be. The guidelines are intended to be guides only and should be read in conjunction with NEMA and the regulations. They are not intended to be a substitute for the provisions of NEMA or the regulations in any way. NEMA further provided an introduction to the compilation of EMFs as per Chapter 8 of the 2006 EIA Regulations. The importance of EMFs in the future of impact management in South Africa has further necessitated the strengthening of the statutory provisions for EMFs. The importance of EMFs within the IEM suite of tools has been recognised and the potential for diversifying its application is being emphasised through the elevation of its statutory position within NEMA in the development of 'stand-alone' EMF regulations, which are known as the *Environmental Framework Management Regulations, 2010*.

2. LEGISLATIVE CONTEXTUALISATION

As stipulated earlier, the contextualisation of the EMFs is entrenched in framework legislation. Section 24(2) of NEMA, and the Environmental Management Framework Regulations of 2010 state that the Minister, and every MEC with the concurrence of the Minister may identify:

- geographical areas based on environmental attributes, and as specified in spatial development tools adopted in the prescribed manner by the environmental authority, in which specified

¹ Environmental Impact Assessment Regulations, 2006



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activities may not commence without environmental authorisation from the competent authority; and

- geographical areas based on environmental attributes, and specified in spatial development tools adopted in the prescribed manner by the environmental authority, in which specified activities may be excluded from authorisation by the competent authority.

The Minister, and every MEC with the concurrence of the Minister, may compile information and maps that specify the attributes of the environment in particular geographical areas, including sensitivity, extent, interrelationship and significance of such attributes which must be taken into account by every competent authority.

“Section 24 (5) stipulates that the Minister, and every MEC with the concurrence of the Minister, may make regulations consistent with subsection (4)-

(bA) laying down the procedure to be followed for the preparation, evaluation and adoption of prescribed environmental management instruments, including-

- (i) environmental management frameworks”

3. PURPOSE AND OBJECTIVES OF EMFs

3.1 Purpose of EMFs

The EMF Regulations provide that the Minister or MEC, with concurrence of the Minister, may initiate an EMF for an area. EMFs that are adopted by the Minister or MEC must be taken into account in the consideration of applications for environmental authorisation in or affecting the areas to which the EMF applies.

The purpose of the EMF is to function as a support mechanism in the environmental impact assessment process in the evaluation and review of development applications, as well as informing decision making regarding land-use planning applications.

NEMA section 24(3) states that EMFs are to be taken into account by competent authorities and 24(4)(b)(vi) states that they must be used by competent authorities in decisions on applications for environmental authorisations. Regulation 2 indicates that the purpose of EMFs is to inform environmental management in the area and to inform decisions on applications for environmental authorisations. The legislative framework accordingly does not make EMFs binding on decisions that are, for example, processed by local authorities.

Similarly, EMFs provide a vast array of information which becomes useful in a diverse field of environmental application. EMFs provide a compilation of information and maps illustrating attributes of the environment for a specific geographical area. Not only useful for the EIA process but also for other planning processes, such as input into SDF's, IDP's and open space planning applications.

EMFs that have been adopted by the Minister can therefore be used to facilitate the compilation and consideration of applications for environmental authorisation in terms of the regulations. In this regard –

- EMFs provide applicants with an early indication of the areas in which it would be potentially appropriate to undertake an activity;

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- Co-operative government is facilitated through the identification of different regulatory responsibilities and recommending mechanisms for addressing the needs of the relevant authorities; and
- The competent authority has information which will guide and inform decision-making.

In addition to the above, EMFs must be considered in environmental management:

- EMFs can be used as a basis for the Minister or MEC to identify areas where environmental authorisation will be required for certain additional listed activities;
- Where the undertaking of certain activities may be excluded from requiring environmental authorisation; and
- For the co-ordinated management of strategic spatial environmental information about a specific geographic area.

3.2 Objectives

The objectives of an EMF include:

- Support informed and integrated decision-making by making significant and detailed information about an area available before activity proposals are generated;
- Contribute to environmentally sustainable development by anticipating potential impacts and by providing early warnings in respect of thresholds, limits and cumulative impacts, and by identifying already existing impacts to be addressed;
- Support the undertaking of environmental impact assessments in the area by indicating the scope of potential impacts and information needs that may be necessary for environmental impact assessments; and
- Support the process of delineating geographical areas within which additional specified activities are to be identified in terms of NEMA;
- Support the process of delineating geographical areas within which activities listed in terms of NEMA may be excluded by identifying areas that are not sensitive to the potential impacts of such activities.

4. PRINCIPLES AND CONTEXTUALISATION OF EMFs**4.1 Guiding Principles for EMFs**

The following principles should be applied in the development of an EMF:

- The EMF should be customised to the context of the area;
- The EMF should be undertaken with reference to environmental goals and priorities;

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- The EMF should encourage sustainable development;
- The scope of the EMF should be comprehensive enough to provide assistance to all levels and types of environmental and planning decision-making in the area;
- The EMF should place specific focus on the issues and information that matter in decision-making in the area;
- EMFs must take into account any EMFs already conducted which may influence the results and scale of the EMF proposed. This will include EMFs conducted at a broader or finer spatial level, as well as adjacent to the study area. Where adjacent EMFs are considered the effect of aligning the edges needs to be integrated,
- Bio-physical, social, economic, and other aspects that are relevant in the area should be reflected in the EMF;
- The EMF should provide insight into specific land-uses and determine if these land-uses are appropriate or not to the receiving environment, taking into consideration the cumulative impact of such land-uses;
- The EMF should be clear and easy to understand;
- The process of developing the EMF must provide for an appropriate level of public participation; and
- The process of developing the EMF should be carried out fairly, impartially and professionally, having regard to legal and policy requirements as well as guidelines that are applicable to the area.

4.2 Determination of the context of an EMF

With regard to the context within which an EMF is developed it must be noted that, although the content of an EMF is prescribed in the regulations, the nature of each EMF will be determined by the context of the area for which it is done and the contents of each EMF will vary accordingly. The context is often determined by a range of factors, including the following:

- The types and nature (and scale) of environmental attributes;
- The types of development pressures experienced;
- The status of conservation of sensitive elements; and
- The need for cooperative government.

5. PROCESS OF FORMULATING AN EMF

This section describes the typical technical development process of the EMF. It considers the various phases and provides detail regarding the end deliverables required for an effective EMF.



5.1 Pre-EMF Development Matters

Before commencing with the EMF, certain administrative and institutional matters should be in place which includes:

- Issues of concurrence (if initiated by the MEC) between the relevant spheres of government;
- Who has initiated the EMF;
- Formal agreements between the relevant parties to the EMF, where and if required; and
- Define the scope of work (terms of reference) for the compilation of the EMF.

The above will ensure a defensible process, which has been agreed to by all the relevant spheres of government, which is important when addressing issues of co-operative governance.

The Terms of Reference should as a minimum:

- define the purpose of the EMF;
- indicate the study area;
- specify information and technical requirements;
- provide for any additional requirements for public participation process;
- specify the methodology and approach to be adopted;
- specify the project deliverables that must be produced; and
- indicate the composition, structure and functioning of the EMF project steering committee.
- indicate the key criteria and aspects which are required in the EMF;
- the operational scale of the EMF;
- identify and be clear regarding the trigger for the EMF; and
- establish the policy objectives of the EMF to address the trigger.

5.2 Technical EMF Development Process

The technical development phases of the EMF can be summarised into five basic phases, namely;

- 1.3 The need for an EMF;
- 2.3 Status quo assessment (including sensitivity analysis, environmental opportunities and constraints);
- 3.3 Desired state of the environment; and
- 4.3 Way forward (including Identification of specific management zones and management guidelines).

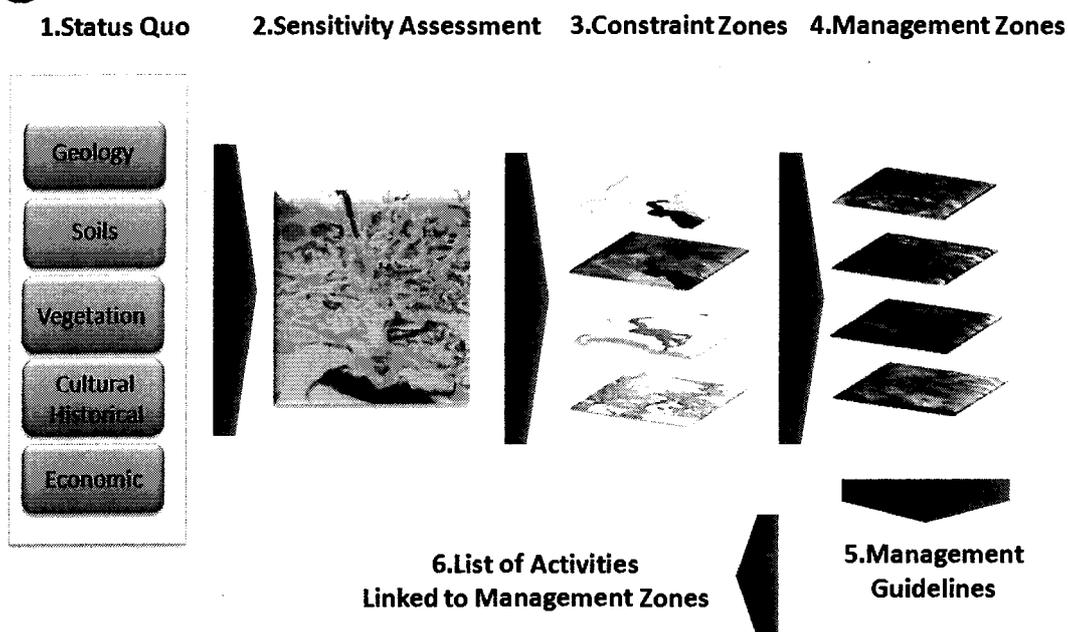

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Figure 1: Overall EMF Technical Phases

5.3 Information Gathering

The platform of the EMF is developed upon baseline information. It is very important to ensure that sufficient emphasis is placed upon the development of the baseline assessment phase. Similarly, the ultimate success of the EMF is determined by the quality and accuracy of primary information input.

5.3.1 Information Gathering, Quality and Detail

Information gathering is an activity that takes place throughout the formulation of an EMF. It is important for defining the:

- Status quo of the project area;
- Environmental opportunities and constraints,
- Development pressures and trends in the area; and
- The establishment of management priorities in and guidelines for the area.

When planning how to produce an EMF, it is important to be systematic and make sure that information is gathered and captured correctly. Accurate and relevant baseline information is imperative to the successful spatial analysis and determination of applicable environmental opportunities and constraints. The saying "Garbage in, garbage out" rings true to the overall effectiveness, acceptability and implementability of the EMF. The status quo assessment forms the repository of all biological, physical, social and economic data, and where applicable and possible should be represented spatially. The spatial mapping of baseline information constitutes the framework and platform upon which the


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EMF is further developed. The eventual quality and relevance of an EMF will to a large extent depend on:

- The information included;
- The credibility of information sources; and
- The quality and detail of the information.

All data sources should accordingly be subjected to stringent quality controls and, in most cases, verified at the source to ensure that errors are not built into the EMF due to erroneous or sub-standard information. New research and high resolution data capture may be required to ensure that the quality of information is both adequate and appropriate.

The level of detail required for spatial data capture, especially in respect of key environmental attributes, will normally vary from 1:1000 to 1:5000. Coarser data is unlikely to meet the requirements of the competent authorities. Spatial data capture requires up-to-date aerial photography and in some instances satellite remote sensing images. There should be clear integration with other information sources where these meet the above criteria of data requirement.

5.3.2 Information that should be included in the EMF

It is necessary to ensure that the content and context of the EMF is appropriate to its application. Information irrelevant to the EMF should not be included. A distinction must be made between information utilised in the status quo assessment for background and information purposes only, and which will have no operative function in the further development and analysis phases of the EMF; and information that will be utilised in the further spatial analysis phases of the EMF development. The typical baseline information that should be included must reflect the following:

- (a) identify by way of a map or otherwise the geographical area to which it applies;
- (b) specify the attributes of the environment in the area, including the sensitivity, extent, interrelationship and significance of those attributes;
- (c) identify any parts in the area to which those attributes relate;
- (d) state the conservation status of the area and in those parts;
- (e) state the environmental management priorities of the area;
- (f) indicate the kind of developments or land uses that would have a significant impact on those attributes and those that would not;
- (g) indicate the kind of developments or land uses that would be undesirable in the area or in specific parts of the area;
- (h) indicate the parts of the area with specific socio-cultural values and the nature of those values;
- (i) identify information gaps;
- (j) indicate a revision schedule for the environmental management framework; and

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- (k) include any other matters that may be specified.

Information management will be important in the compilation of the EMF as the primary platform for all analysis is represented spatially. The project steering committee should jointly decide on the information matrix and the requirements for the baseline spatial data. In order to manage this process effectively and to ensure that a record is kept with regards to the credibility of information used, an information metadata matrix should be developed.

The information matrix should include the following:

- The nature and type of information required;
- The format of the information;
- The scale and quality of the information;
- The approach to getting and capturing the information; and
- The information source.

5.3.3 Information sources

As referred to above, the emphasis on reliable, accurate and current spatial information will establish the integrity and efficiency of the EMF. Baseline information sources should primarily be structured around the acquisition of existing information sources. Generation of new data sets should only be done in situations where:-

- Required and appropriate spatial information pertinent to the analysis does not exist;
- Where the scale is too broad and not detailed enough for the application; and
- Where serious discrepancies regarding the integrity of existing information exists.

Links with other baseline sources should firstly be established, before the generation of new data sets. Similarly, where other initiatives are underway or which have been completed, this information should be utilised in the EMF where appropriate.

5.3.4 Access to information

The project steering committee should assist the service provider with access to information, especially information of which a statutory body is the custodian.

The utilisation of existing data sets must take the following into consideration:-

- The information must be from an acceptable source e.g. South African National Biodiversity Institute and other sources which have already been through a broad consultative process, and where the information has been reviewed, verified and ground truthed;

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- The inclusion of existing data (i.e. systematic conservation plans etc) must be consolidated as a baseline for the EMFs;
- EMFs must look at national and provincial targets rather than just local targets in instances where biodiversity, air, water and waste decisions are made;
- EMFs should align biodiversity, air, water and waste targets to those contained in the National Biodiversity Framework and National Biodiversity Strategy and Action Plan as far as possible;
- The EMF process needs to synergise with existing information;
- As far as possible and relevant use must be made of local information initiatives, plans of provincial importance such as Provincial Growth and Development Strategy; and
- EMFs should address implementation issues of broader initiatives, such as bioregional plans.

Information can be obtained from various sources including:

- Government institutions such as SANBI, Department of Rural Development and Land Reform, DWA and DEA;
- Bioregional plans and Biodiversity Conservation Assessments applicable to the study area;
- Municipal cadastral and zoning documents;
- Aerial photography which should be used for surveys, ground truthing and intensification of information gathered from less accurate sources;
- Information in the databases of government departments;
- Strategic development frameworks and integrated development plans applicable to the area;
- Information gathered as part of other projects in the area;
- Government policies;
- Site/area surveys;
- Specific local subject specialists; and
- Interviews with stakeholders, community leaders, and the general public during the public participation process.

5.4 Status Quo Assessment

The following diagram illustrates the various levels of information input and the interphase and relationship between the descriptive analytic data.



1. Status Quo Assessment

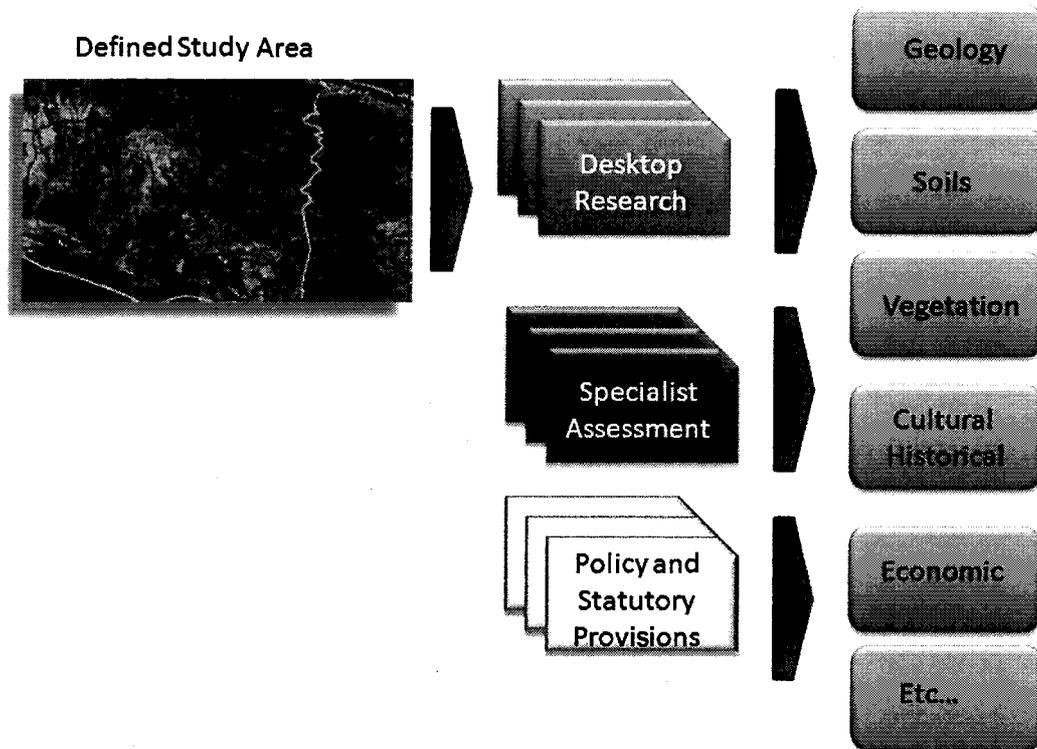


Figure 2: Status quo technical assessment

5.4.1 Determining the project boundary

On commencing the project, a clear delineation of the project boundary is required. When considering the boundary, it is important to have a clear understating of how the specific EMF will be applied and administered. A logical demarcation should be used such as:-

- An administrative boundary;
- Cadastral boundary;
- Water catchment boundary; or
- Logical ecological delineation (e.g. vegetation type, biome or eco-region).

5.4.2 Content of the Status Quo Assessment

Once the need for an EMF has been determined, an assessment of the status quo of the area must always form the point of departure for producing an EMF. The exact contents of the status quo section


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will depend on the specific requirements of the authorities and context of the area. The following is a broad list of typical categories and attributes that should be included in an EMF:

- Geology, including geological stability;
- Geohydrology, including water quality, water quantity and irrigation potential;
- Surface hydrology, including drainage systems, flow rates, water quality and ecological requirements;
- Topography, including landscapes and visual character;
- Soil, including erosion potential and agricultural potential;
- Vegetation, including important habitats, threatened species and conservation potential;
- Fauna, including threatened species and conservation potential;
- Current use of land depicting the actual uses that occur on land in detail;
- Infrastructure and engineering services, including water provision, sanitation, transportation elements, electricity, solid waste disposal and telecommunication;
- Current and potential sources of air pollution;
- Current and potential sources of water pollution;
- Current and potential sources of noise or other types of irritation;
- Land which is subject to mining activities;
- Cultural and historic features, including archaeological sites, old buildings, important structures and sites associated with current use or past events and religious structures and sites;
- Population characteristics, including spatial distribution, structure, income levels, age, gender, literacy and growth trends;
- Economic characteristics, including employment sectors, economic drivers and growth sectors;
- Current development and planning trends and processes, including the SDF's and IDP's;
- Current laws, policies, plans and programmes that are applicable in the EMF area;
- Other environmental management plans or frameworks that may exist in respect of the area covered by the EMF being conducted; and
- Existing reports undertaken in terms of other legislation.

The status quo assessment should also address the interrelationships between the different attributes as well as the importance of the attributes in the context of the area. Issues and trends in respect of attributes should also be described, where appropriate.

In order to ensure that the end product is both practical and scientifically based, information should be translated into data categories (e.g. hydrology), which consists of data features (e.g. natural flood plain, flood dissipation areas, river course, sandbanks, wetlands etc.). Each of the features should then be described and its current status should be established.

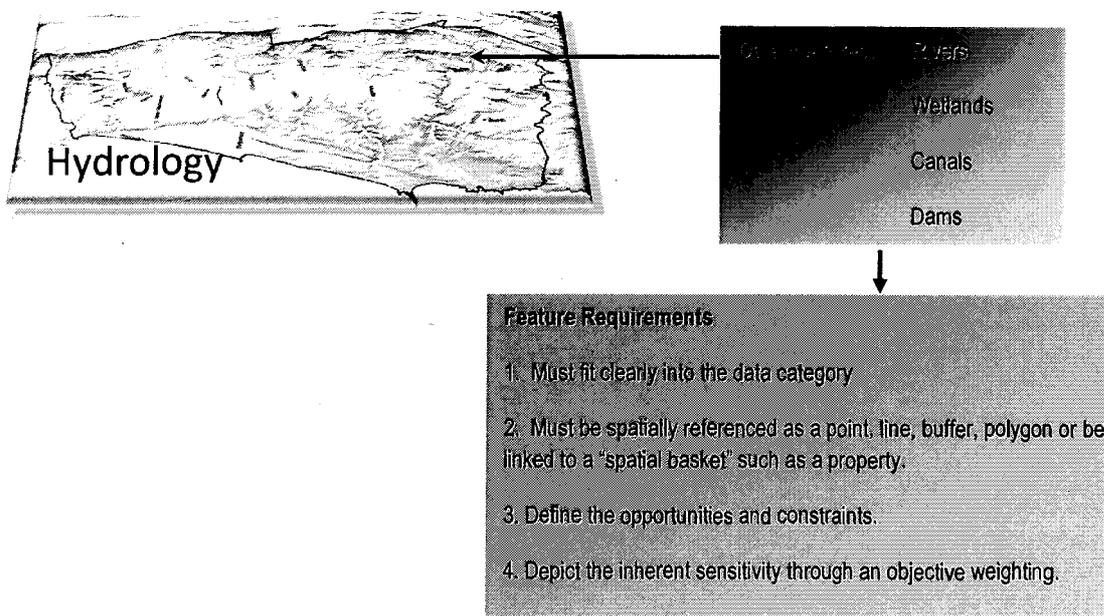

ENVIRONMENTAL MANAGEMENT FRAMEWORKS: Guideline 6
Data Category


Figure 3: Status Quo Data Structure

5.5 Desired State of the Environment

The analysis and evaluation of the baseline information, issues raised throughout the public participation process, and authority requirements identifies and provides the basis for establishing environmental priorities. These priorities are expressed in a 'Desired State of the Environment' report which is used to develop the management guidelines and strategic objectives of the EMF. Furthermore, objectives of the EMF will establish principles on how the environmental resource should be managed to improve its environmental status. Priorities will typically be focused around critical environmental conflict points and could include:

- Conservation;
- Protection of cultural and heritage landscapes;
- Natural resource protection;
- Land-use planning;
- Waste management;
- Ambient air quality;
- Energy use;
- River health;
- Groundwater use and quality;
- Access to the open space system; and
- Rehabilitation or reuse of derelict land.



5.6 Identifying development pressures and trends

In order to establish what can realistically be achieved in the area in bridging the gap between the status quo and the desired state, it is also necessary to understand the development pressures, trends and needs in the area. Development trends, pressures and needs should be identified. These trends and pressures may come from a range of issues such as:

- Population growth;
- Population distribution;
- Population structure (age and gender);
- Income distribution;
- Education and literacy;
- Employment sectors;
- Economic drivers;
- Natural resource exploitation;
- Growth sectors;
- Development policies and plans.

5.7 Environmental Sensitivity Analysis

The environmental sensitivity analysis is the product of the integration of the various baseline information layers as defined in the project status quo assessment, after assessing it in terms of current policies and discussions with key stakeholders. The purpose of the environmental sensitivity analysis is to provide an overarching view of the inherent environmental sensitivity of the study area. Functionally the sensitivity analysis does not contribute substantially to any further downstream development in the EMF, and it is primarily used as a 'control' to test the applicability and accuracy of the identified environmental constraints and opportunities.

The sensitivity analysis is determined by allocating a weighting, or value to each of the environmental features in the status quo spatial layers. The subjectivity regarding the allocation of weighting is largely removed through the use of acceptable scientific knowledge. An environmental sensitivity evaluation, represented spatially in the EMF, comprises the integration of all the data categories and features. The specific feature weightings determine the level of environmental sensitivity, which ranges as low, medium, high and very high.

In this stage of the EMF, baseline information is transformed into secondary information that attaches value to different features. The following figure illustrates the data integration process of baseline data to depict overall environmental sensitivity.

The sensitivity analysis can be used additionally as a platform for the identification of open space systems, and for spatial support in conservation planning initiatives.



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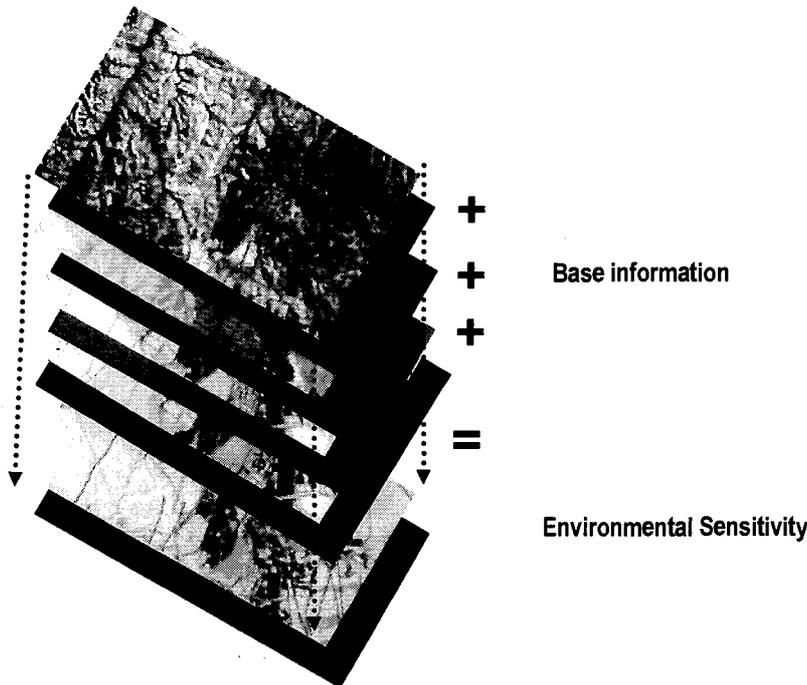


Figure 4: Environmental Sensitivity Evaluation

5.8 Feature Status and Weighting

The status of each of the features is determined through legislative requirements, accepted norms and quality standards, as well as through technical and specialist input. The status of a feature will determine the type and extent of the management intervention required. Feature status can be improved through the establishment of stringent management requirements (parameters/responses). The weighting of each individual feature, where possible, should illustrate the feature’s inherent sensitivity to development pressure or resilience to change. In order to retain a certain degree of objectivity the band or spectrum of weighting is kept narrow.

Table 1: Example of a typical Feature Value Criteria

Weighting	Description	Sensitivity
-1	The inherent feature status and sensitivity is already significantly degraded. Any significant environmental development change will not influence the current status.	Low / poor
0	The inherent feature status and sensitivity will not be influenced by any significant environmental – development change.	Undetermined
+1	Environmental – development change will influence the current status of the feature, either negatively or positively.	High
+2	Environmental – development change will significantly influence the feature, either negatively or positively.	Very high


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5.9 Identifying Constraint Zones -Establishing opportunities and constraints

These can also be considered environmental sensitivity zones, or land-use opportunity and constraint zones. Environmental constraint zones are a spatial representation of the critical environmental aspects identified in the foregoing processes. Environmental constraint zones also determine the fitness and environmental suitability of a specific area for certain types of development based upon the baseline inventories and the values and inherent characteristics of land-uses of the area, as well as the sensitivity assessment.

Opportunities may include aspects such as:

- Areas that can accommodate specific development growth demands with minimal environmental impact;
- Sensitive environmental attributes that can be conserved within the current policy and resource capacities of the different spheres of government; and
- Limits on pollution and waste generation that can be achieved without significant cost.

Examples of constraints include:

- Population growth trends that exceed the ability of the area to accommodate the anticipated additional housing demand in areas that are not environmentally sensitive;
- The location of good building sand in an area with a habitat for rare and endangered species; and
- Low ambient air quality in an area where there is a high demand for industrial growth.

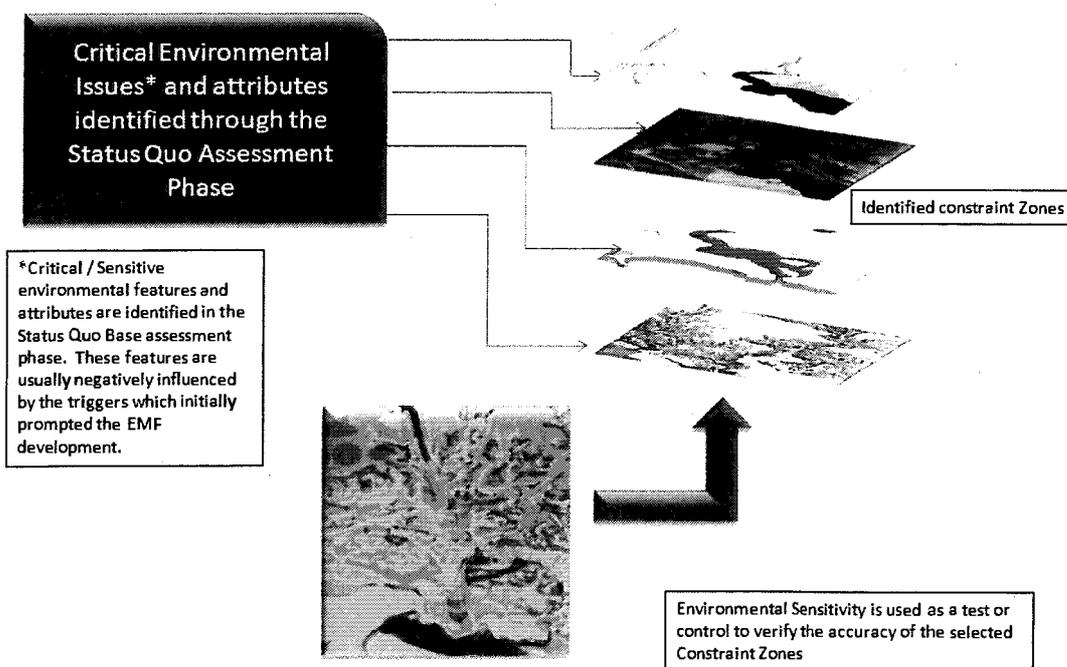


Figure 5: Determining Environmental Constraint Zones



5.10 Management Zones

The purpose of management zones is to focus attention of the relevant authority on the critically important areas and to facilitate effective decision making in them. Management zones should inform decisions for proposed activities in all identified areas. Management zones will similarly 'red flag' critical environmental areas and ensure that any development applications lodged in these areas adhere to the management criteria (management guidelines).

The development of the management zones are informed by the integration of a selection of the critical environmental constraint attributes. The management zones illustrate the interrelationship between the various attributes, specifically focusing on the peculiarities which determine their sensitivity.

These areas are structured around a derived function of the environmental constraint zones consolidating and integrating specific categories which reflect a homogeneous composition, and which have been identified through the EMF development process as being significantly sensitive to development pressure to warrant specific management intervention.

Usually, the sensitive environmental components which have been identified upfront as a motivation for developing the EMF will feature quite prominently in the development of the management zones.

Once the management zones have been identified, they are then linked to management parameters and guidelines in the management guidelines document.

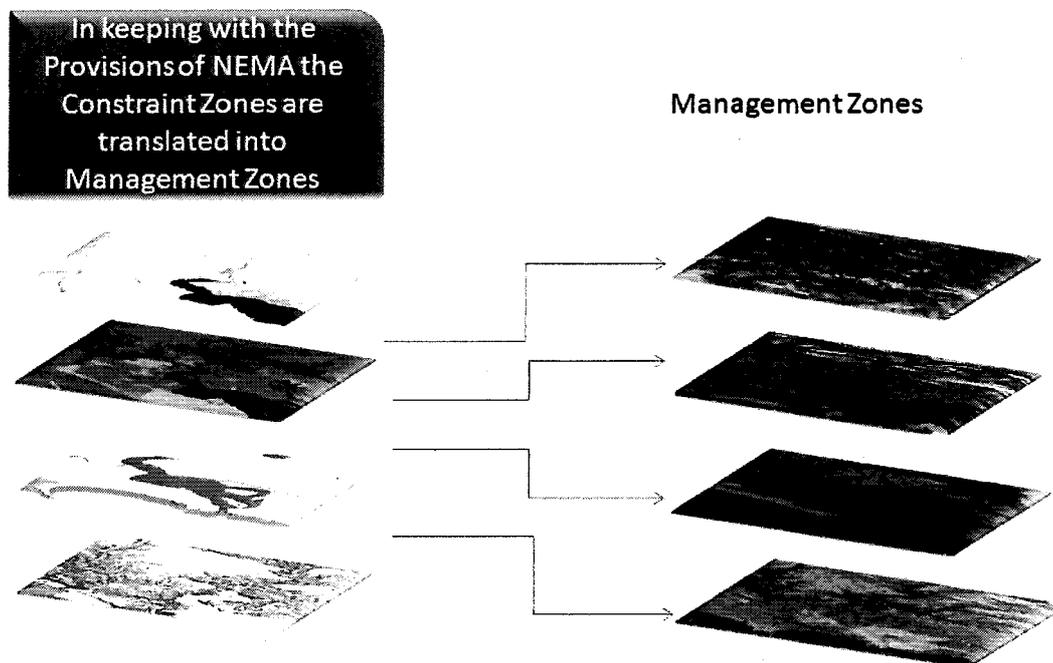


Figure 6: Determining Management Zones



5.11 Management Guidelines

The functionality of an EMF is largely dependent on the implementability of the recommendations made in the management guidelines. The purpose of the management guidelines is to link management requirements to each of the attributes comprising the geographical areas, or management zones. The guidelines are not prescriptive regarding land-use and do not indicate which land-uses must occur in which areas. Rather, the guidelines indicate specific minimum environmental requirements and performance criteria, through management parameters, which have to be met satisfactorily before approval of a development application should be considered.

After the assessment of inputs from the public participation process and information gathered from the various assessments; management provisions and guidelines can be developed. These provisions and guidelines should be informed by the opportunities and constraints which have been identified and should aim to:

- Integrate the outcomes of the desired state of the environment,
- Clearly define and address any management objectives which have been established and identified through the development of the desired state of environment,
- Maximise the opportunities to the benefit of both the environment and development in the area;
- Make clear recommendations regarding the way that development should occur in a specific geographical area;
- Provide guidance as to the environmental thresholds to development in a geographical area;
- Identify development that would not be appropriate in sensitive areas; and
- Manage the constraints of the area through interventions that seek to protect the environment against significant impacts while being sensitive to the social needs and aspirations in the area.

Similarly the management guidelines could indicate the level of assessment required in the specified geographical area. The management guidelines can also be used as the environmental input for the LDO and IDP processes. The management guideline introduces a risk-averse approach to development planning decision-making. It fulfils the requirements of the environmental management mandates of the specific authorising authorities (if other authorities accept it), while it does not impose land-uses on the planning mandate of the local authorities. They in effect establish performance standards or criteria which must be met before a certain use will be permitted. These criteria usually involve a combination of economic, environmental and social factors.

5.11.1 Other issues to consider for the Management Guidelines

The content of the management guidelines should be structured from existing policies, statutory provisions and guidelines. This will ensure that the management guidelines are defensible and based upon existing, recognised and accepted management information. Environmental priorities established in the desired state of the environment provide the framework for the management objectives of this


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document. In addition to the above issues for management guidelines, the following should also be considered:

- Environmental management priorities in the area;
- Existing statutory and regulatory provisions (e.g. Acts and regulations);
- Management guidelines sourced from other approved plans and programmes (e.g. PSDFs and IDPs that have already been put through public review and a consultative process, and which have subsequently been adopted by the relevant provincial and local authorities);
- Accepted ordinances and local authority provisions; and
- Existing provincial policies and guidelines.

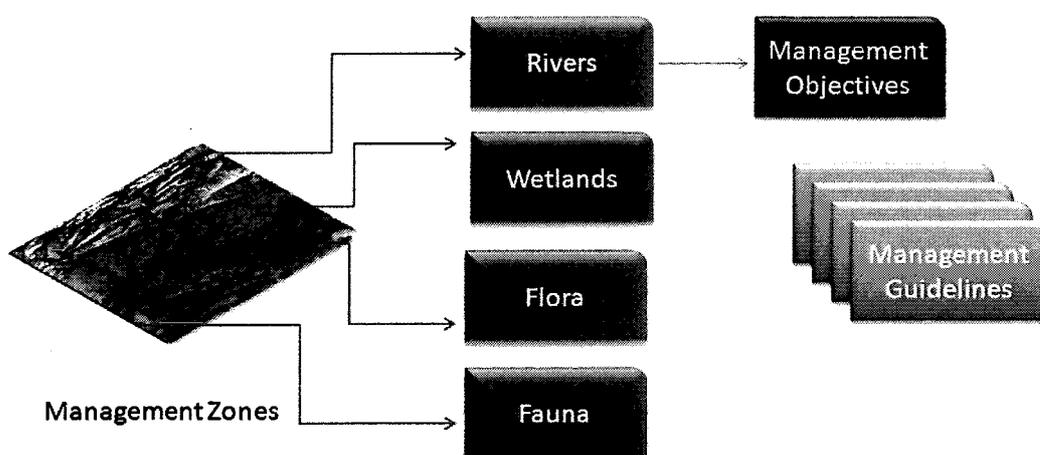


Figure 7: Determining Management Guidelines

5.12 List of Activities

Section 24(4A) of NEMA makes provision for the listing or identification of activities that require environmental authorisation before being undertaken as well as activities that may be excluded from the requirement of obtaining environmental authorisation. An EMF can be used to inform decisions regarding whether additional activities should be listed for the area or whether certain activities should be excluded from requiring environmental authorisation. The actual inclusion and exclusion of activities requires a separate legal process.

The sensitivity of the environment depicted through the management zones, together with the opportunities and constraints illustrated in the management guidelines will provide an indication of which listed developments and land-uses could be excluded from a certain area (excluded from obtaining an environmental authorisation); any additional developments and land-uses which may have a substantially negative influence on the environment which should be included; the kinds of developments and land-uses that are undesirable in the area or part of the area; and make

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recommendations with regards to the type of assessment that would be required for additionally identified developments and land-uses.

5.13 The Structure and content of the EMF Report

In terms of the regulations, an EMF must contain the following:

- An identification of the area – whether by map or otherwise;
- A specification of the environmental attributes in the area, including sensitivity, extent, interrelationship and significance of the attributes;
- An identification of any parts in the area to which the attributes relate to;
- An indication of the conservation status of the area;
- A description of the environmental priorities in the area;
- Indicate the kinds of developments or land uses that would have a significant impact on those attributes and those that would not;
- Indicate the kinds of developments and land-uses that would be undesirable in the area or specific parts of the area;
- Identify information gaps;
- Indicate a revision schedule for the environmental management framework; and
- Any matters specified by the Minister or MEC.

It is recommended that for completeness, the EMF report should also contain the following (depending on the nature and context of the EMF):

- The terms of reference for the EMF;
- A description of how information was captured;
- A description of the public participation process including issues raised by I&APs;
- The desired state of the environment;
- Development pressures and trends;
- Opportunities and constraints; and
- Management proposals and guidelines.

5.14 The EMF in GIS Format

The information contained in EMFs can be linked to the attributes in a spatial manner. GIS seems to be the most widely and easily used tool for spatial integration of data in the development of EMFs and can be used to provide quick answers to relatively complex scenarios.

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An integrated GIS can often be developed as the main structural element in the production of an EMF around which the various inputs and outputs are centred. The GIS could also ensure that the results of the EMF continue to be useful provided that it is updated periodically in order to deliver an ongoing up to date input into the environmental management of the area.

The GIS can also be made available on a user-friendly GIS-viewer. The GIS-viewer can play an important role in the use and application of the EMF as it integrates two important components of the EMF, namely an integrated spatial data set and a database containing the description of spatial entities. Most importantly, it can also integrate the management proposals and guidelines that are applicable to specific areas.

The GIS-viewer could also contain a report function, which takes an image of a selected area from the GIS map, together with all the attribute data relating to that specific point, and prints it to a structured report that can be taken away and used for inclusion in other documents.

5.15 Keeping the EMF current

The EMF Regulations requires that a revision schedule for the EMF must be indicated. It is therefore imperative that the EMF remains current to ensure its applicability over time. Monitoring of the implementation of the EMF over a reasonable review period should take place to ensure that environmental improvement has indeed taken place. The EMFs should be reviewed, where possible, together with the respective IDPs and SDFs for the area. Only relevant data needs to be updated during the review such as land-use, population, and other dynamic data sets prone to short to medium term change. Static data layers remain, unless more appropriate and detailed information has been developed during the update period.

6. PUBLIC PARTICIPATION PROCESS**6.1 Process required by the regulations**

The regulations require that the following processes be conducted as a minimum as prescribed by sub-regulation 2 (c) of the EMF regulations:-

- Make the draft EMF available for public comment,
- Inviting potential I&APs by means of advertisements in newspapers, and any other appropriate way,
- Take appropriate steps to ensure that reasonable means have been implemented to engage with I&APs which are illiterate, disabled and have any other disabilities,
- Consider representations and comments,
- To review the draft to include relevant comments,
- Prepare a comments and responses report.

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The EMF regulations currently do not provide more detail because of the differences in context and size that may occur from one area to another in developing an EMF. The requirements of the regulations should therefore be regarded as minimum requirements and, in most instances, it will be necessary or preferable to conduct a broader public participation process that takes place during the entire development of the EMF. The remainder of this section provides detail on the undertaking of a broader public participation process and should be applied as a guideline.

6.2 Phases in public participation

The emphasis of public participation in the development of an EMF is to disseminate information about the EMF and its development to the broader public; elicit comments and suggestions, and to obtain input on the status quo and what the desired state of the environment should be in the area under consideration. The participation process will therefore usually have at least three goals, namely:

- To inform interested and affected parties (I&APs) of the EMF process and its objectives;
- To provide an opportunity for inputs from I&APs; and
- To give feedback to I&APs with the opportunity for them to respond.

To achieve the objective of the public participation process, the process is normally conducted in phases. The phases relate to input required in the process and timing with regards to the significant project development milestones. Each of the proposed phases is discussed below.

6.2.1 Phase 1: Preparation

Phase 1 of the public participation entails:

- An initial meeting with the regulatory authorities that have jurisdiction in the area,
- The compilation of a preliminary database of potential I&APs, and
- The preparation of documentation that is necessary for the public participation process, including -
 - A background information document (BID);
 - Project advertisements to be published in local and regional newspapers (as required by the geographical extent of the EMF. EMFs of national importance should be advertised in a nationally distributed newspaper); and
 - Invitations to attend the initial open day and public meetings, as well as agendas for the meetings.

The aim of a BID is to provide accessible background information on the proposed EMF approach and process. The BID is distributed to the I&APs who are listed in the database. (The most appropriate language or languages to be used in the BID should be determined by the languages spoken in the area).

To allow for the involvement of I&APs who have not been identified through the meeting with the regulatory authorities in the early stages of the process, the regulatory authority must subject the draft EMF to a public participation process by making it available for public inspection at the convenient

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place, and must invite potential I&AP's by way of advertisement in newspapers circulating in the area and in any appropriate way to inspect the draft and submit representations, and comments in connections with the draft. In addition, it is required that reasonable alternative methods are taken to ensure appropriate participation by individuals with special needs or any other disadvantage.

The invitations to attend the open day and public meeting, as well as the agendas should be communicated to the public and I&APs, and be prepared in advance to ensure input from all members of the project team regarding the information to be communicated to the public.

6.2.2 Phase 2: Stakeholder consultation

This phase of the participation process focuses on interaction with I&APs. To ensure that I&APs are afforded sufficient opportunity to engage in the process, it is recommended that they are afforded an opportunity to comment or provide input, as a minimum, at the following milestones:

- During information gathering phase;
- On completion of the status quo assessment;
- Completion of the constraint zones and environmental sensitivity evaluation;
- Desired state of the environment; and
- Upon finalisation of the management zones and management guidelines.

The extent of consultation will greatly depend on the nature and sensitivity of each EMF. Large scale regional EMFs will require extensive consultation at various levels and amongst different community profiles. The approach to consultation should be flexible and the level of literacy should similarly influence the approach. In order to ensure appropriate consultation with I&APs, various approaches could include:

- Presentations;
- Open days with static displays;
- Focused group and subject specialist meetings; and
- Interviews with local leaders and councils.

Public open days and public meetings should be advertised in the most widely read local and community newspapers, by means of flyers and I&APs on the database should receive personal invitations. The aim of public open days are to provide I&APs with more information about the proposed EMF and to invite I&APs to provide inputs regarding their views on current practises and their desired state of the environment and development for the EMF area.

Feedback on the progress of the project should also be provided during the public meeting. Minutes of the meeting should be distributed to I&APs that attended the meeting.

In addition to the open days, a structured interview process can also be used to identify issues, viewpoints, concerns and attitudes held by the various stakeholder groupings in the area. Similarly they should reflect the aspirations of the various stakeholder groupings in the area. These surveys must be

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of sufficient scope to be statistically acceptable and should include a realistic reflection of the stakeholder groupings within the project area.

I&APs should be engaged on an ongoing basis to ensure that they are informed of the project progress and that they are able to communicate issues and concerns to the project team. The issues, comments and concerns raised during phase 2 should be captured in a comments and response report which should form part of the draft EMF. The comments and response report should consist of:

- A description of the strategy and process followed;
- A list of issues, comments and concerns raised during the public participation process;
- A list of the registered I&APs;
- Responses to comments;
- Conclusions and recommendations; and
- Minutes of meetings and written comments received during the public participation process (where applicable).

6.2.3 Phases 3: Public review and reporting phase

Phase 3 takes place during the finalisation of the EMF process and entails providing feedback and soliciting comments on the draft EMF. The EMF must be made available for review by the public. There are no set timeframes for commenting. However, it is recommended that at least a 30 day review period should be provided. After the commenting period, the EMF must be revised to reflect any comments which are accepted.

The EMF report should include a section on the public participation process.

6.3 Access to the final draft EMF

The draft final EMF report should be available for public perusal in an accessible location and format. Usually the size and format of the full EMF document content is too large and expensive to provide multiple copies, and singular copies will have to be placed strategically for inspection. Full electronic versions should be made available on the web interphase of the competent authority. Summary documents could be available for more accessibility.

7. INSTITUTIONAL ARRANGEMENTS

The success of any EMF lies in its implementation and application. The institutional structure to ensure that the EMF can, and will be applied in practice depends largely on the buy-in and support of all spheres of government, especially the competent authorities mandated with managing the environment.



7.1 Concurrence

Section 24(2) of NEMA, and the Environmental Management Framework Regulations of 2010 stipulate that the Minister, and every MEC with the concurrence of the Minister, may identify geographical areas, based upon environmental attributes, in which specified activities may not commence without the approval and authorisation of the competent authority, and similarly activities which may be excluded from authorisation by the competent authority.

Section 24 (3) further stipulates that the Minister, and every MEC with the concurrence of the Minister, may compile information and maps that specify the attributes of the environment in particular geographical areas, including sensitivity, extent, interrelationship and significance of such attributes which must be taken into account by every competent authority.

The further implication for the EMFs is that the Minister, and every MEC with the concurrence of the Minister, may make regulations which are consistent with subsection 4 of NEMA, in laying down the specific procedure to be followed in the compilation of the EMFs.

In issues of national importance the Minister may solely initiate an EMF. However, for any EMF that has been triggered by issues of a provincial and local nature the MEC, with the concurrence of the Minister, may initiate. This concurrence further strengthens the EMF adoption process in terms of adopting the EMFs as provided for by the EMF Regulations of 2010 ensuring support for the EMF at all spheres of government.

7.2 Co-operative Governance

It is imperative that the EMF be developed in a spirit of co-operative governance between all spheres of government. Similarly it is important to ensure that all the respective government role-players and decision makers who are directly affected by the implementation of the EMF are part of the development process and that it has been supported from the inception.

The following broad principles should be applied in ensuring co-operative governance:

- The various partners to the EMF must jointly be in agreement on the purpose of the EMF;
- The parties should not have conflicting mandates;
- The roles and responsibilities of the various spheres of government in the development and implementation of EMF must be clearly established;
- Establish clear distinction between the roles and responsibilities of various levels of government;
- There should therefore be clear agreements between the different spheres of government;
- The agreement should define the desired state of the co-operative governance, roles and responsibilities in the application of the EMF;



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- The EMF can provide the framework to highlight areas of, and achieve co-operative agreements;
- Establish network agreements between officials before escalating the agreements to higher levels of co-operation; and
- The practical agreements for implementation of the EMF needs and requires continuation after the adoption of the EMF.

7.3 Role and Responsibility of Government

The Minister or MEC, as the case may be, is the custodian of the EMF once it has been adopted, and the competent authority has to take it into account in decisions on applications for environmental authorisations and in environmental management activities.

8. ADOPTION AND IMPLEMENTATION

Regulation 5 of the EMF Regulations makes provision for the EMF to be adopted by the Minister or MEC as the case may be. Once adopted, the Minister or MEC, as the case may be, must publish a notice in the Government Gazette indicating that the EMF has been adopted and details of where the EMF can be viewed. It has to be considered during the evaluation of development proposals through the environmental impact assessment process, as well as activities which may have a negative impact on the geographical area.

The intention is to ensure that development decision making is not hampered, and that informed decisions are made upfront in the development process, i.e. discouraging activities in sensitive areas that will have a negative effect on the environment.

8.1 Implementation strategy

The inclusion of an implementation strategy in the EMF can add significant value. A proposed strategy should address the following:

- Linkages between planning and policy instruments and options for incorporating information contained in the EMF;
- Approaches to co-operative government; and
- Allocation of responsibilities between authorities to ensure desired outcomes



9. CONCLUSION

The importance of EMFs within the IEM suite of tools has been recognised and the potential for diversifying its application is being emphasised through the elevation of its statutory position within NEMA in the development of 'stand-alone' EMF regulations, which are known as the *Environmental Framework Management Regulations, 2010*. The purpose of the EMF is to function as a support mechanism in the environmental impact assessment process in the evaluation and review of development applications, as well as informing decision making regarding land-use planning applications. EMFs provide a compilation of information and maps illustrating attributes of the environment for a specific geographical area.

EMFs are useful for the EIA process as well as for other planning processes, such as input into Spatial Development Framework's, Integrated Development Plan's and open space planning applications. They are strategic level decision support instruments that assist environmental impact assessment. The EMFs should be reviewed, where possible, together with the respective IDPs and SDFs for the area. They contribute to environmentally sustainable development by anticipating potential impacts and by providing early warnings in respect of thresholds, limits and cumulative impacts, and by identifying already existing impacts to be addressed. The guideline will be revised on a regular basis or when there is a need arise. Monitoring of the implementation of the EMF over a reasonable review period should take place to ensure that environmental improvement has indeed taken place.

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