

**An Assessment of the Land-Use Capability of the  
Liesbeeck Black River Confluence Area**

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**A dissertation submitted in partial fulfillment of the degree of the  
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**Department of Environmental and Geographical Science,  
University of Cape Town**

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## SYNOPSIS

### PURPOSE AND AIMS

As a consequence of increasing development pressure and demands on the Liesbeeck Black River Confluence Area (hereafter referred to as the Confluence Area), the Cape Town City Council (CCC), which has the responsibility for land-use planning in the Confluence Area (CA), recognised the need for a focused land-use study to be undertaken. Preliminary baseline information therefore, was collected by the Environmental and Geographical Science Masters class and is presented in the environmental baseline study (MPhil class, 1994).

This is an individual study that serves to review and assess the baseline information. It aims to provide general recommendations for future land-use planning in the CA, which optimise the inherent environmental capabilities of the area. It attempts to present to the decision-makers and land-use planners a holistic environmental information base for more informed land-use planning.

### THE APPROACH

The approach employed adopts underlying principles of the Integrated Environmental Management (IEM) process and land-use planning.

This study is a pre-planning land-use capabilities assessment closely aligned to land-use planning. It is an activity that requires planning at the abstract and overarching level. It is however, inherent with conflicts and uncertainties which vary in nature, scale and magnitude.

The Integrated Environmental Management (IEM) process, orientated to site specific projects, could not provide a systematic format for this pre-planning study. The IEM principles however, have been incorporated. These are defined as:

- a broad understanding of the term 'environment';
- proactive and positive planning;
- informed decision-making;
- public participation and
- accountability.

The problem thus remains to find or construct a systematic procedure that integrates the IEM principles into a visionary process such as land-use planning.

In an attempt to marry this conceptual difference the land-use capabilities assessment approach has been employed in this study. The methods adopted are aligned to evaluation studies of the existing environments. This has been attained by assessing the inherent 'capability' of the CA to support a broadly defined land-use, i.e. structural development. The principle behind this 'capabilities' approach is that by denoting a land-use, the inherent limitations to, and opportunities for the CA are made apparent, pointing the way

to a more suitable land-use. In other words, the greater the limitation to development, the greater the opportunity for a land-use suited to the inherent capabilities of the CA.

The general procedure employed is an adapted form of the overlay technique, originally initiated by McHarg (1969). The Swartkops River Basin evaluation report (1979) provided the underlying process for this study. As this focused on evaluating alternative land-uses, and overlooked the existing structural environment, the process was modified.

The procedure followed, is defined:

- The environmental parameters in the baseline report (1994), are reviewed and assessed.
- A land-use is defined as structural development.
- Controlling factors are determined, i.e. the environmental parameters considered to govern the intrinsic capacity of the CA for the location of structural development. These are grouped into actual and potential controlling factors according to the influence they presently or potentially exert. The potential factors are identified to provide insight for future development planning and design. The actual factors are then assessed. The latter are identified to be flooding, wetland habitat, historical and archaeological features, land-use and landownership, land-use controls; zoning and rezoning and the existing road services.
- The actual controlling factors (excluding the road services) are assessed in terms of the constraints they impose on structural development, and constraints maps are provided for each factor.
- A composite development constraints map is produced and accompanied by a discussion on each of the controlling factors for defined land units. Limitations of, and opportunities for structural development, are identified.
- Conclusions and recommendations, according to each land unit are presented.

The underlying criteria for the assessment are equity, efficiency and sustainability. In addition, the national, regional and local factors such as land-use policies and plans, and the social issues determined by the I&APs, are used throughout the assessment. This provides greater context and degree of objectivity.

The land-use policies and plans and social issues are also reviewed and assessed independently in order to highlight the off-site, abstract factors and concerns. Subsequently, an attempt is made to ensure that land-use planning decisions for the CA, address the key social concerns and consider the land-use policies and plans that presently or potentially influence development in the CA.

## **ASSUMPTIONS AND LIMITATIONS**

In undertaking this study it has been assumed that:

- The information presented in the environmental baseline study for land-use decisions in the Liesbeeck Black River Confluence Area is correct, unless otherwise stated.
- The terms 'environment' and 'environmental' encompass the biological, physical, social and economic factors, unless otherwise stated.
- Development of any form could be undertaken in the CA, given the required technical skills, economic feasibility and social support. To provide a useful assessment and to focus this study, certain infrastructural features and land-uses have been assessed in terms of their fixed or changeable status.

The main limitations of this study have been identified as:

- The recommendations of the Culemborg Black River(C-BR) study will probably have major implications for the CA, yet this study had to proceed without a full awareness of what those recommendations might be.
- The selection of the controlling factors was undertaken by the author alone, being subject to academic requirements, and time and money constraints.
- Subjectivity was avoided where possible, and reasons for its inclusion have been outlined.
- The maps were produced manually; the Geographical Information Systems (GIS) technique would have been more appropriate, but was beyond the resources of this study.

## CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations for this study are determined according to the land-use and landownership perspective, as delineated in the baseline document. Four land-uses however, presented themselves as separate land units: Raapenberg Bird Sanctuary, the Peninsular Golf Driving Range, Valkenberg Hospital eastern campus and the area below the Medical Research Council land, referred to as the CCC eastern land unit. These have been discussed individually.

The main conclusions and recommendations for each land unit are presented in the study. The key criteria governing the future use of the land units are defined. The key land-use policies and plans and social issues are also concluded and recommendations are provided.

### *RAAPENBERG BIRD SANCTUARY*

This land unit is considered to be the most conservation worthy land unit in the CA. It is an important wetland habitat for avifauna given the threatened number of wetlands in the Cape Town Metropolitan Area (CMA).

#### Recommendations:

- RBS should be excluded from any form of structural development and
- RBS should be maintained as a sanctuary, and
- Public access and management of the area should be upgraded and extended to incorporate the Rosenfontein, Varslvei and Pallotti wetlands.

***THE CCC LAND (EXCLUDING THE RBS, PENINSULA GOLF DRIVING RANGE AND THE EASTERN LAND UNIT)***

The Old Liesbeeck River, the Liesbeeck River, the Liesbeeck canal and the Black River are the predominant water bodies in the area, thus flooding is considered to be the key physical constraint for development. Flooding is however a fundamental resource for the wetland habitats. The wetland habitats are important habitats for avifauna and they are regionally significant given the few remaining wetlands in the CMA.

**Recommendations:**

- The CCC land should be excluded from structural development.
- The wetland areas within the CCC land of Rosenfontein, Varsvlei and Pallotti should be incorporated into the Raapenberg Bird Sanctuary.

***TRANSNET AND SARCC LAND***

This land unit, currently occupied by the Liesbeeck Sportsgrounds, contains several conflicting limitations to, and opportunities for development. The limitations imposed by the biophysical factors result in development being unsuitable, while the land-use and rezoning factors encourage development.

**Recommendations:**

- Structural development should be excluded from this area. This is justified by the fact that the biophysical limitations, flooding and wetland habitat, can be overcome by technical skills, but this could entail considerable expenditure and the loss of future options.
- Public participation should be retained in the 'package of plans' approach to development.

***VALKENBERG HOSPITAL WESTERN CAMPUS (VHWC)***

The controlling factors dictate that the VHWC should remain and continue to provide health care, forensic and psycho-geriatric and neurological services to the local and regional community.

**Recommendations:**

- Structural development should be restricted to institutional activities and the development plans should allow for public participation.
- Prior to development, due consideration should be given to the historical components of the hospital, i.e the outbuildings of conservation potential and the main administration building, which is a National Monument.

### ***THE SOUTH AFRICAN ASTRONOMICAL OBSERVATORY (SAAO)***

The controlling factors suggest that the SAAO remains and continues to provide educational and research facilities, and image processing for the observing station in Sutherland.

#### **Recommendations:**

- The research and educational facilities should be improved, thus encouraging greater public access and involvement.
- Structural development should be restricted to institutional activities and the development plans should allow for public participation.
- Due consideration should be given to the historical and cultural component of the institution.

### ***ALEXANDRA CARE AND REHABILITATION CENTRE (ACRC)***

The controlling factors dictate that the ACRC be retained as a functioning hospital for congenitally retarded and brain damaged patients.

#### **Recommendations:**

- Structural development should be restricted to institutional activities and the development plans should allow for public participation.

### ***VINCENT PALLOTTI HOSPITAL***

The controlling factors dictate that Vincent Pallotti Hospital should remain as a health care service, for the local and regional communities.

#### **Recommendations:**

- Should structural development be deemed necessary for institutional activities, the Council must approve the development proposal.

### ***THE NATIONAL MONUMENTS COUNCIL (NMC) LAND***

Based on the fact that the land has been leased to UCT for 75 years, and that the Homestead and outbuildings are currently being renovated and upgraded as part of the UCT Courtyard development, development cannot be prohibited. Development should therefore continue.

#### **Recommendations:**

- An archaeologist should be present during construction in the archaeological precinct.
- The existing edifice of the Homestead and outbuildings should be maintained.

### ***THE UCT LAND***

Based on the fact that the UCT Courtyard development is at an advanced stage of construction, development cannot be prohibited. The underdeveloped areas however, should be reviewed.

#### **Recommendations:**

- Should the land, or part thereof, be developed it is recommended that the IEM procedure be followed when assessing future land-use.

### ***VALKENBERG HOSPITAL EASTERN CAMPUS (VHEC)***

The controlling factors suggest that the VHEC should be redeveloped.

#### **Recommendations:**

- Prior to development, due consideration should be given to the fact that the area is located in an historical precinct, and that there are a number of buildings of conservation potential.

### ***MAITLAND RESIDENTIAL AND INDUSTRIAL AREA (MRI)***

Based on the existing residential, commercial and light industrial land-uses and the rezoning conditions, opportunities for development are restricted.

#### **Recommendations:**

- The residential dwellings and commercial and light industrial services should be upgraded to improve housing and job creation services.
- Public participation should be encouraged in future land-use change and development proposals.

### ***MAITLAND GARDEN VILLAGE***

Based on the existing land-use, cultural component of the village and the land-use controls, there are conflicting limitations to, and opportunities for development. There is also the need for improved housing, education and job creation.

#### **Recommendations:**

- The village should be developed in order to upgrade and improve the existing homesteads, and provide needed residential units in previously undeveloped portions of land in the village.

### ***MEDICAL RESEARCH COUNCIL (MRC) LAND***

The controlling factors suggest that the area is suitable for development. Based on the existing undeveloped status of the land, the General Commercial Use zone and the fact that there is an application to amend the rezoning conditions (currently being assessed by the Administrator), development could be feasible.

#### **Recommendations:**

- The proposed development should comply with the relatively low density character of the area.

### ***THE PENINSULA GOLF DRIVING RANGE***

The non-fixed status of the land-use and the fact that the land is zoned for Single Dwelling Residential, suggest that the land is suitable for development.

#### **Recommendations:**

- Prior to development, due consideration should be given to the inhabitants of Maitland Garden Village, and the cultural aspect of the village.

### ***THE CCC EASTERN LAND UNIT***

According to the land-use controls and the existing undeveloped status of the land-use, there are conflicting limitations to, and opportunities for structural development.

#### **Recommendations:**

- Should development in the area be deemed necessary, this should comply with the zoning requirements, and public participation should be incorporated into the planning stage of the development.

### ***THE LAND-USE POLICIES AND PLANS***

The review and assessment of the land-use policies and plans highlighted certain key factors that should be considered in future land-use planning. These have been identified:

- Prior to development, due consideration should be given to these overarching land-use policies and plans; the CMA Guide Plan, the Interim Metropolitan Development Framework (IMDF) and the C-BR study.

### ***THE SOCIAL CONCERNS***

The review and assessment of the social issues identified key metropolitan and site-specific issues that must be considered in future land-use planning in the CA.

- A land-use plan should be formulated that accommodates the need for development and the need for open spaces, and incorporates public participation into its process.
- Should any of the land in the CA be developed for structural, aquatic, recreation or open space development, the IEM process should be followed.

### **CONCLUDING COMMENTS**

In light of these conclusions and recommendations, the controlling factors suggest that certain land units are more viable to development than others.

According to the social concerns there is a call for a comprehensive land-use plan for the CA, that involves public participation and subsequently addresses the conflicting needs of development and conservation, and site-specific demands.

It is therefore concluded that, any proposed land-use action for any of these land units must be developed using the IEM procedures and the IEM principles. These principles are:

- Informed decision-making;
- Accountability for decisions taken and for the information on which decisions are based;
- A broad meaning of the term 'environment';
- An open participatory approach in the planning of proposals;
- Consultation with interested and affected parties and
- Proactive and positive planning.

These conclusions and recommendations also highlight the underlying procedural limitation of this study.

The IEM process, principles and procedures apply to site-specific and project orientated development, whereas land-use planning constitutes a broader perspective. There are therefore, some basic limitations in applying the IEM procedure at this pre-planning stage of development.

The only readily applicable components are: issue generation through public participation, and scoping of the existing environmental factors. The former component was addressed in the baseline document. The latter component has been undertaken in this study. It is not possible to proceed to the next stage of the IEM process without specific development proposals whose potential impacts can then be assessed.

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# CHAPTER ONE

## INTRODUCTION

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### 1. BROAD NEEDS OF THE URBAN AREAS OF SOUTH AFRICA

The rate and scale of urbanisation in South Africa is very rapid. It cannot be prevented and should not be combatted (UPRU, 1990). It is potentially a highly positive phenomenon and its success depends entirely on how the process is managed. Compounding this is the fact that the structure of decision-making is complex, often disenfranchising large sections of the city's population, as administrations, organisations, institutions and interest groups make decisions according to their own agenda. This determines the way cities are developed. Yet, underlying these socio-economic urban factors are the essential natural environmental characteristics, which have often been ignored, abused or forgotten in urban development and planning.

In light of these factors, there is a need to marry the needs of the people and the needs of the city within their natural (or semi-natural) environmental parameters. A cohesive, proactive planning approach is required in order to create efficient, sustainable and equitable urban development in South Africa.

### 2. BACKGROUND TO THE STUDY

Cape Town has not escaped the problems of urbanisation. Development pressures coupled with the necessity to fulfil the needs of the expanding metropolitan population in the light of a changing government, has put pressure on the controlling authorities to work out cohesive development plans. It is, therefore, critical that land-use planning is undertaken in an informed, open and participatory manner, which aims to accommodate both development pressures and countervailing environmental considerations.

The Cape Town City Council (CCC), one of the major management bodies operating within the province, is presently engaged in an on-going urban planning exercise. Their current thinking recognises the need to contain development in the metropolitan area (i.e. promoting more intensive use of the land and high density development), while at the same time attempting to retain as much open space as possible.

The Liesbeeck Black River Confluence Area (hereafter referred to as the CA), being relatively undeveloped and situated close to the Central Business District (CBD) of Cape Town, has come under increasing pressure for development. The most immediate pressures are from developments such as UCT Courtyard development, currently underway and the Gateway Park proposed development, approved in December 1993.

There are also development pressures from Transnet and the South African Railways Corporation (SARCC) which are undertaking national rationalisation studies. As part of that process they are examining the most profitable way of releasing up to 300 ha of prime land in the Culemborg Black River (C-BR) area, immediately northwest of the CA. A portion of the land in the C-BR area overlaps with the CA. These rationalisation studies are part of the C-BR study, which has adopted a 'package of plans' approach (see Chap.5, no.2.5).

There are also less immediate pressures from massive projects such as the Olympics 2004, the creation of an Export Processing Zone (EPZ) and the Millennium Exposition. Optimal land-use planning decisions are, therefore, crucial.

As a consequence of the increasing development pressure and demands on the CA, the CCC, which has responsibility for land-use planning in the study area, recognised the need for a focused land-use study to be undertaken.

The Environmental and Geographical Science Masters class were approached to undertake the study. Preliminary baseline information therefore was collected and is presented in the baseline document (MPhil class, 1994). This baseline information is then reviewed and

assessed in this individual study, and general recommendations for future land-use planning in the CA are provided.

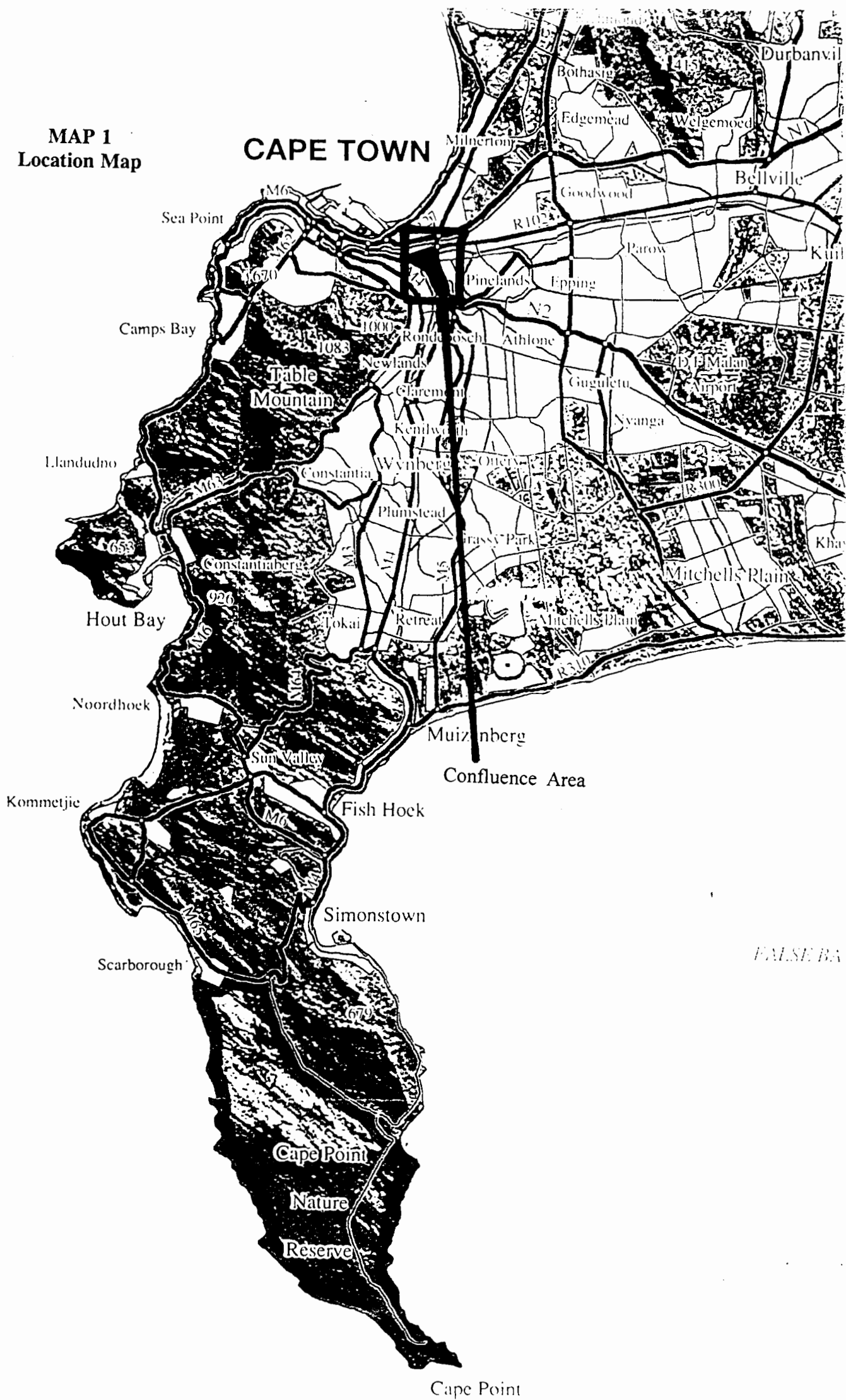
### **3. DEFINITION OF THE STUDY AREA**

The study area (hereafter referred to as the CA) is the same as the baseline report. The CA is located approximately 5.5 kms east of the Cape Town CBD, at the point where the north-flowing Liesbeeck and Black Rivers meet (see Map 1). This may be defined as the portion of land that is bounded by the N2 Freeway to the south; the Liesbeeck Parkway to the west; and Alexandra Road to the east. In the north the boundary runs along Berkley Road to the Black River Parkway, then follows the western edge of the Parkway to the railway bridge across the Black River. The boundary continues westwards, along the northern border of the open space immediately above the Old Liesbeeck River Course, until it meets Liesbeeck Parkway (see Map 2). The total size of the area is 232 hectares.

The CA is relatively undeveloped. There are only a few principal land-uses in the area, which have remained relatively constant over the past 25 years. The northwestern area between the Liesbeeck River and the Old Liesbeeck River is mainly occupied by the Liesbeeck Sportsgrounds, with the exception of the northern tip and river banks which are left as vacant land. The western area between the two rivers is occupied by the South African Astronomical Observatory (SAAO), the western campus of Valkenberg Hospital, and the recently commenced University of Cape Town (UCT) Courtyard development.

The Vincent Pallotti Hospital, the Medical Research Council (MRC) land designated for the Gateway Park development, the eastern campus of Valkenberg Hospital and Maitland Garden Village occupy the south and eastern portion of the CA. Alexandra Care and Rehabilitation Centre (ACRC) and the Maitland Residential and Industrial area occupy the northeastern portion of the study area. Raapenberg Bird Sanctuary (RBS) comprises a small area between the Black River, the SAAO and Valkenberg Hospital western campus.

**MAP 1**  
**Location Map**



The Peninsula Golf Driving Range is located between the Black River and Maitland Garden Village. There are also certain areas which are less developed, such as the area below the Valkenberg Homestead which adjoins the Liesbeeck Lake. These, coupled with the undeveloped nature of the occupied areas in the CA, emphasise an open space ambience.

Landownership is limited to a comparatively small number of institutions and individuals. These include the State in various guises; the CCC, the National Monuments Council (NMC); Foundation for Research and Development (FRD), the Department of Community Development, the Department of Community Health and Welfare and the Medical Research Council. Adjoining landownership also includes various individual owners of small residential and commercial properties in Maitland Garden Village and Maitland Residential and Industrial Area; the privately owned Vincent Pallotti Hospital, Transnet and UCT land.

The areas surrounding the CA are mostly residential, recreational and light industrial areas, i.e. Observatory, Maitland, Mowbray, Pinelands and Ndabeni (see Map 2).

The physical boundary of the study has not limited the scope of the study, as this would be an unrealistic analysis. In light of this, the natural, biological and ecological features are viewed as systems, not as single units set by the boundaries of the study. Similarly, the concerns of the local and regional Interested and Affected Parties (I&APs) have been determined and assessed.

#### **4. AIMS AND OBJECTIVES**

The aim of this study is to provide recommendations for future land-use planning in the Liesbeeck Black River Confluence Area, which optimise the inherent environmental capabilities of the area.

In order to address this aim, a number of objectives have been determined. These are:

- To review and assess the environmental parameters determined in the baseline report (1994);
- To define a land-use, i.e. structural development;
- To determine the actual and potential controlling factors, i.e. the environmental parameters considered to govern, or potentially govern the intrinsic capacity of the CA for the location of structural development;
- To assess the actual controlling factors in terms of the constraints they impose on structural development;
- To provide constraints maps for each controlling factor;
- To produce a composite development constraints map;
- To discuss and summarise the spatial information presented on the composite constraints map;
- To identify the limitations to, and opportunities for structural development and
- To provide recommendations for future land-use planning.

## **5. APPROACH AND METHODS**

This study is a pre-planning land-use capabilities assessment (hereafter referred to as the land-use assessment), which aims to provide reliable and useful information and recommendations for future land-use in the CA. It aims to present the decision-makers and land-use planners an holistic environmental information base for more informed land-use planning.

This study is closely aligned to land-use planning as it is an activity that requires planning at the abstract and overarching level. It is also highly complex, inherent with conflicts and uncertainties which vary in nature, magnitude and scale.

The Integrate Environmental Management (IEM) process, which is orientated to site specific projects (see Chap.2, no.2), could not provide a systematic format for this pre-planning study. The principles have however been incorporated in the assessment, i.e a broad understanding

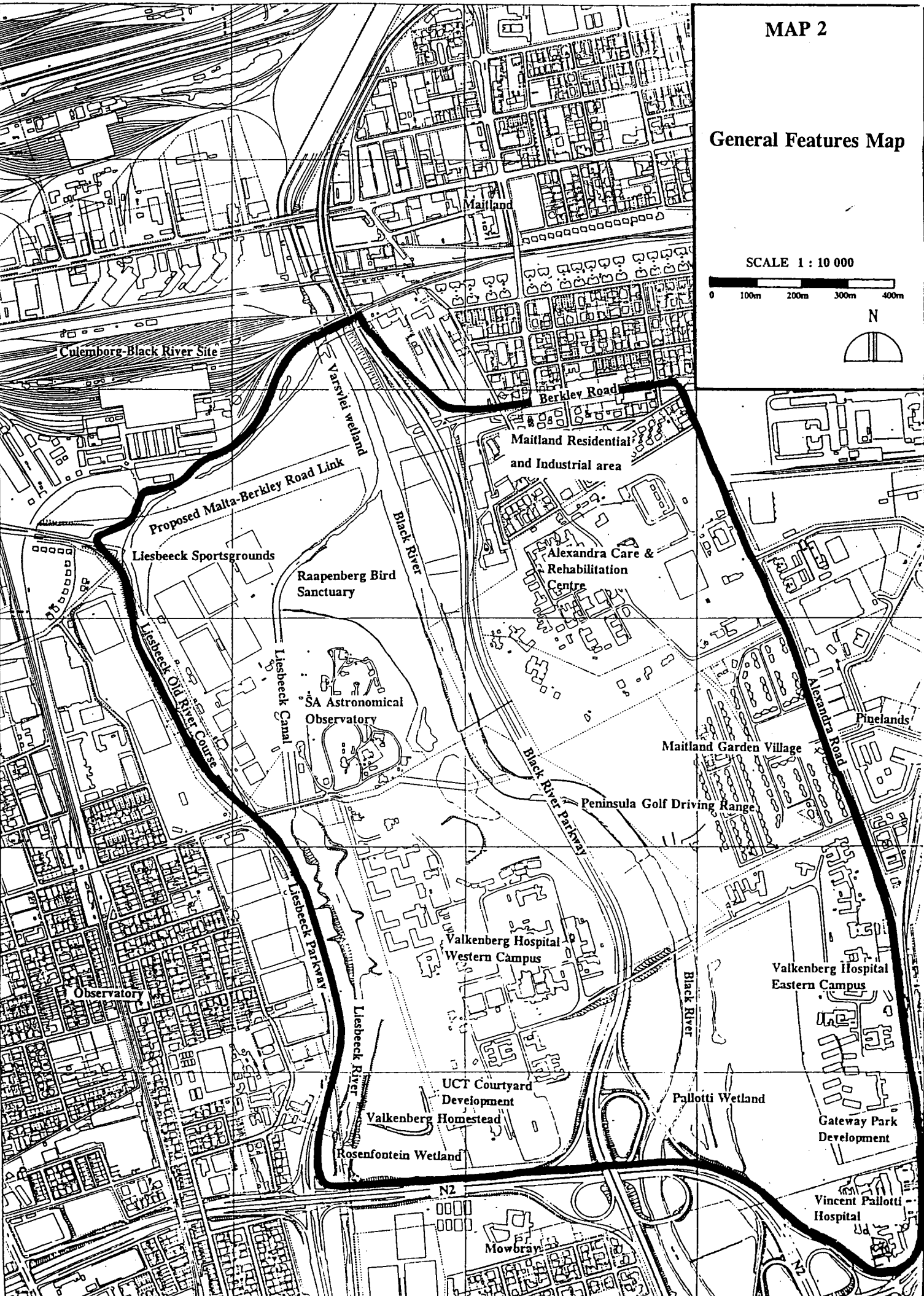
MAP 2

General Features Map

SCALE 1 : 10 000

0 100m 200m 300m 400m

N



of the term 'environment', proactive and positive planning, informed decision-making, public participation and accountability.

The problem thus remains to find or construct a systematic procedure that integrates the IEM principles into a visionary process such as land-use planning.

The methods therefore, adopted for this study are aligned to the evaluation of the existing environments. The CA is assessed in terms of its inherent capacity to support a broadly defined land-use, i.e. structural development (see Chap.4, no.1.1). The principle behind this 'capabilities' approach is that by denoting a land-use, the inherent limitations to, and opportunities for the CA are made apparent. A more suitable land-use is then identified. In other words, the greater the limitations to development, the greater the opportunities for a land-use suited to the inherent capabilities of the study area.

The general procedure employed in this study is an adapted form of the overlay technique, originally initiated by McHarg (1969). The Swartkops River Basin evaluation report (1979) provided the underlying process. The report however, is more aligned to evaluating alternative land-uses, and did not look in detail at the existing structural environment. For this reason, the process was adapted.

The procedure undertaken (see Chap.3, no.4), began by reviewing and assessing the environmental parameters defined in the baseline report (1994), and determining the controlling factors according to their actual or potential influence on a defined land-use, i.e. structural development. The actual controlling factors are then assessed in terms of the constraints they impose on structural development. A value scale of major, medium and minor constraint is denoted for each controlling factor and are presented on a constraints maps. The areas falling within each category, i.e. major, medium and minor are identified and shaded. Lastly, the constraints maps are overlaid to produce a composite development constraints map. The spatial information is then discussed in terms of defined land units. Recommendations are provided to conclude the assessment.

The underlying criteria for the assessment are equity, efficiency and sustainability (see Chap.3, no.2.3). Consequently, to provide context and objectivity, the national, regional and local factors such as policies and plans, and the social issues determined by the I&APs have been reviewed and used throughout the assessment.

## **6. ASSUMPTIONS AND LIMITATIONS**

In undertaking this study it has been assumed that:

- The information presented in the environmental baseline study for land-use decisions in the Liesbeeck Black River Confluence Area is correct, unless otherwise stated
- The terms ‘environment’ and ‘environmental’ encompass the biological, physical, social and economic factors, unless otherwise stated.
- Development of any form could be undertaken in the CA, given the required technical skills, economic feasibility and social support. To provide a useful assessment and to focus this study, certain infrastructural features and land-uses have been assessed in terms of their fixed or changeable status.

The limitations of this study have been identified as:

- The recommendations of the Culemborg-Black River study, currently being undertaken, will probably have major implications for the CA; yet this study had to proceed without a full awareness of what those recommendations might be.
- The selection of the controlling factors has been undertaken by the author alone, being subject to academic requirements, and time and money constraints.
- Subjectivity has been avoided where possible, and reasons for its inclusion have been outlined.
- The maps have been produced manually; the Geographical Information Systems (GIS) technique would have been more appropriate, but was beyond the resources of this study.

## 7. REPORT STRUCTURE

At the beginning of this study, a synopsis is presented, which provides a brief outline of the purpose and aims of the study, the approach and methods adopted and the assumptions and limitations, and highlights the main conclusions and recommendations.

The main body of the study consists of eight chapters. Chapter 1 provides a general overview and introduction to the study. It includes background information, outlines the aims and objectives, and highlights the assumptions and limitations of the study. The approach and methods are also briefly reviewed.

Chapter 2 examines the theoretical basis of this study. The IEM process, principles and procedures are discussed, and land-use planning theory is briefly reviewed. The similarities and differences of the IEM process and land-use planning are then defined, and the capabilities approach employed in this study is described.

Chapter 3 defines the capabilities approach adopted and reviews the methodologies and limitations for this study; i.e. the overlay technique and Swartkops River Basin evaluation procedures. (1979). The actual procedures followed and the problems of bias and decision-making are then described.

Chapter 4 identifies the controlling factors. The terms 'structural development' and 'controlling factors' are initially described. The methods used to identify the controlling factors and the presentation of the assessment are then described. The latter part is the assessment of the environmental parameters, where the actual and potential controlling factors are determined. Two summary tables of the controlling factors are provided at the end of the chapter.

Chapter 5 provides a preliminary review and assessment of the land-use policies and plans and the social issues. The actual and potential influence of the policies and plans are defined.

The key social issues at the metropolitan and site specific context are determined. These are the social issues that have not yet been addressed in the former assessment.

In chapter 6 the controlling factors are assessed and the constraints maps for each controlling factor are presented. This is consists of two sections. The methods, presentation and problems are described in the former section. The assessment and maps follow in the latter section.

In chapter 7 the composite development constraints map is presented and discussed. The discussion translates the spatial information presented on the composite constraints map to text format. A summary table is also provided.

Chapter 8 presents the conclusions and recommendations arising from the study. General concluding comments are also provided.

Additional information of relevance to the study is contained in the appendices.

The theoretical basis of the study is provided in the following chapter.

“Sound planning principles well executed, will achieve the maximum potential from the land and guide development so that future inhabitants of the world receive the basic necessities of life and also the benefits of a satisfactory environment” (Lovejoy, 1973)

## CHAPTER TWO

# THE THEORY

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### 1. INTRODUCTION

The principles and methodologies employed in this study are adopted from the Integrated Environmental Management (IEM) process and land-use planning. The assessment procedures however, did not comply completely with either of the two approaches. To better understand the methodologies undertaken, the theoretical basis is outlined, presenting the meanings, purposes and principles of IEM and land-use planning. The similarities and differences are discussed and analysed, and the theoretical basis and the general approach employed in this study are described.

### 2. INTEGRATED ENVIRONMENTAL MANAGEMENT (IEM)

IEM is a procedure designed to ensure that the environmental consequences of development proposals are understood and adequately considered in the planning process (Dept. of Env. Affairs, 1992). The IEM process, which was formulated in South Africa, was derived from the environmental impact assessment process, originally formalised in the United States of America (USA) through the National Environmental Policy Act of 1969.

The purpose of the procedure is:

- to stimulate creative thinking in the planning and initial design stage of a development;
- to provide a systematic approach to the evaluation of proposals;
- to formalise the approval process in the decision-making stage and
- to ensure that monitoring and desirable modifications take place in the implementation stage.

In essence, the procedure aims to guide rather than impede the development process of a proposal, programme or plan, through a positive and interactive approach, in a form that can be easily understood by non-specialists (Dept. of Env. Affairs, 1992). It also aims to resolve or mitigate any negative impacts and to enhance the positive aspects of development proposals (Dept. of Env, Affairs, 1992).

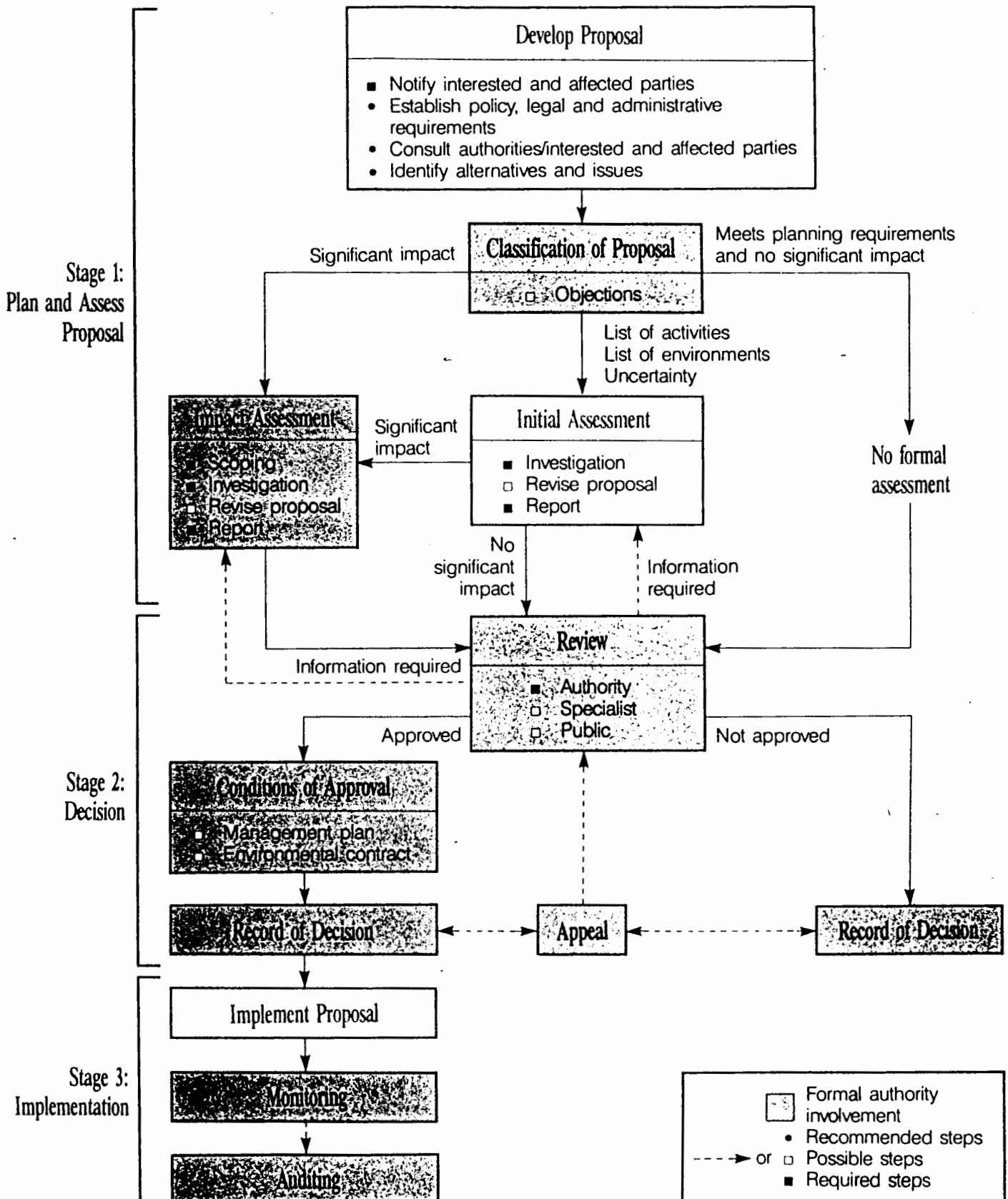
To complement the overall purposes, there are five basic principles underpinning IEM (Preston, Robins and Fuggle, 1992). These are listed:

- The term 'environment' is taken to include physical, biological, social, economic, cultural, historical and political components.
- Informed decision-making should be achieved by integrating contributions from professionals involved in all disciplines relevant to the planning of a particular proposal. Due consideration should also be given to alternative options, including the no-go option.
- A record of a decision and the rationale behind it is required for each decision taken, and should be made available to the public on request. This will facilitate accountability for decisions made.
- Public participation is actively encouraged during the planning stage of a development proposal or during scoping, i.e. the procedure used to focus an impact assessment. Public review of the final findings of an environmental assessment is also advocated as part of the IEM procedure.
- A positive and proactive approach should be maintained through the enhancement of positive impacts and the mitigation of negative impacts. It attempts to ensure that the costs of development are outweighed by the social benefits.

The procedure consists of three main steps; develop and assess the proposal, the decision making and the implementation of the proposal. These are outlined in Figure 1. This systematic method proves to be an essential tool in guiding development proposals, programmes and plans in South Africa.

**FIGURE 1**

**THE IEM PROCEDURE**



It does not however, incorporate a process to evaluate pre-planning development options i.e planning at the non-specific and broader context, where development proposals have not been suggested. The land-use assessment of the CA falls within this pre-planning category, where there are no specific land-use plans for the area (see Figure 2).

### 3. LAND-USE PLANNING

“Societies make continuous changes in the environment and many of these changes result from some kind of land-use planning. Hence land-use planning can be looked upon as both an all-inclusive process and as a collection of related activities” (Fabos, 1985).

Land-use planning is an activity that requires planning at the more general, objective and abstract level, that results in guides, administrative policies and statements of general intent (Zube, 1980). Design is also part of planning. It is more site specific, subjective and detailed activity that results in physical change of the environment. In essence, it provides “sufficient instruction for the implementation of both planning and further design” (Fabos, 1985). As used in this study, however, these terms are synonymous, and refer to activities that resolve physical environmental needs and problems and provide for conscious change in the environment.

Land-use planning is undertaken at a number of different levels (Fabos, 1985). These are described:

- Policy planning which advocates national or regional planning;
- Structure planning often carried out for regional or urban planning;
- Planning for local and community levels, such as zoning and the final phase of new land-uses, and building structures.

Land-use planning is a dynamic and evolving process. Planners have responded to land-use issues for many centuries. Until this century physical solutions were mainly offered to land-use issues. The introduction of zoning during the early 20th Century provided new,

nonphysical or legal devices to deal with land-use issues, and has since been expanded by many additional legal devices and numerous economic, social and policy-planning actions (Fabos, 1985). It has thus become a highly complex activity pursued by numerous public agencies at all levels of government and by private consultants and planners.

Land-use planning has also evolved with scientific findings, new technology and changing social values. The role of natural science, for instance, has provided and continues to provide planners with the understanding of the quantity, the quality, the location and the distribution of the resource base, and the environmental effects or impacts of the various land-uses. This has helped the transition from single purpose planning toward integrated planning, where it is recognised that the solution of one problem often creates another.

The process of land-use planning is similar to many planning processes. In its simplest form it consists of a few basic steps that is:

- identification of the problems, opportunities or needs;
- assessment of the environmental, social and economic resources which are needed to solve the problem or satisfy the needs;
- the setting of plausible goals and objectives;
- development of alternative plans and
- selection of an alternative for implementation.

The process however, is not so simple. Planners must identify all interrelations between the socio-economic, political, environmental and cultural aspects, and provide an optimum land-use plan. Inherent in this process are the conflicts and uncertainties of the land-use issues.

Land-use issues are inherently complex, varying in nature, magnitude and scale. Three common characteristics have however, been identified by Fabos (1985). All land-use issues present or generate one or more uncertainties, and in essence this is why land-use issues are articulated. "The human need for greater certainty provides the compelling reason for all planning, whether social or economic" (Fabos, 1985).

Secondly, planning is mainly concerned with conflicts; each issue has a supply and demand aspect. This is important where the common issue is, how and to what degree one modifies the existing natural and cultural environments, by trying to provide the demands of human society.

Thirdly, that an issue can be perceived as an opportunity or as a constraint. Traditional single purpose planning perceived issues to be problems to be dealt with controls and regulations. More recently issues are perceived to be opportunities and not constraints.

Land-use planning is thus highly complex and demands the expertise of many disciplines, and efficient and effective planning procedures.

These land-use issues are not uncommon to land-use planning for the Liesbeeck Black River Confluence Area: There are conflicting needs and demands made on the CA (see Chap.5; no.3); the uncertainty lies in the natural environmental parameters, such as the flooding hazard and yet there are a number of opportunities for the area. This latter point forms the focus of the study (see Chap.1; no.4).

#### **4. THE COMPARISON OF IEM AND LAND-USE PLANNING**

The differences and similarities of the IEM process and land-use planning, have provided a focus for the land-use assessment of Liesbeeck Black River Confluence Area.

Two similar principles underpin the IEM procedure and land-use planning. These have been identified as proactive planning and informed decision-making.

Proactive and positive planning: To stimulate creative thinking to overcome environmental and land-use issues, i.e to act positively and creatively by foreseeing and avoiding problems, and by finding opportunities instead of reacting to problems. The IEM procedure advocates the enhancement of positive impacts and the mitigation of negative impacts. Land-use

planning refers to activities that advocate and implement the opportunities of a land-use issue; rather than strict control of the problem. This involves conflict resolution or mitigation, avoidance of inherently 'uncertain' issues and the optimum trade-off between the demand and supply of land-use issues. (The approaches to obtain the optimum land-uses have been an inherent difference between IEM and land-use planning as described below.)

Informed decision-making: Integrating contributions from professionals in all disciplines relevant to the particular development proposal or land-use issue is required in the IEM procedure. Similarly, land-use planning requires the expertise of many disciplines.

Three differences have been identified; the main one being the conceptual focus of each of the disciplines. The others relate to the term 'environment', public participation and accountability.

There is a fundamental *conceptual difference* between these two disciplines. IEM is a systematic procedure used to ensure that environmental consequences of development proposals, programmes and specific plans are understood and adequately considered. Land-use planning is a complex activity. At the level of policy, regional and structure planning, it is a more general, objective and abstract activity that results in guides, administrative policies and statements of general intent. At the site specific level it is more of a detailed and subjective activity that results in physical changes in the environments (Zube, 1980).

Environment: A broad understanding of the term 'environment' is not common to IEM and land-use planning: It is an inherent principle in the IEM procedure identified in no.2, but is a relatively new concept in land-use planning. Traditional urban planning for instance, has been controlled by socio-economic aspects and is implemented for political reasons (Lovejoy, 1973). Similarly, resource planning has been concerned with resource management in terms of production, movement, distribution, consumption and conservation. In other words, the natural and existing physical environment has been viewed as a passive framework, subject to manipulation at will by sound engineering techniques (Lovejoy, 1973). This concept is currently changing with more scientific knowledge and broader understanding of the basic,

underlying ingredient of land-use planning; the natural and physical environment. There is also general concern that the natural environment is reaching its limits of sustainability.

Public participation: This is advocated throughout the IEM process, but is a relatively new concept in land-use planning. Traditionally, planning was undertaken in an authoritative manner relying mainly on professional expertise (Zube, 1984). This effectively denied public involvement, thus was susceptible to overlook important user-based values and needs. Additionally, it was used to justify plans determined by the professionals or developers. More recently, public input has been incorporated into a number of stages in the land-use planning process, for instance to help identify the needs and problems to be resolved, and the optimum land-uses for an area.

Accountability: For decisions and the information on which they are based, accountability is inherent in the IEM process, but has been lacking in land-use planning. Exclusive reliance on the expertise of professionals and decision-makers provided a medium for hiding the values and assumptions. This concept is changing, as public participation becomes part of the land-use planning process.

By defining the differences and similarities it becomes apparent that IEM and land-use planning have the same goal; proactive and creative planning that avoids or mitigates negative, uncertain or conflicting issues. Similarly, it becomes apparent that IEM principles stipulate the future needs of land-use planners, i.e. a broader understanding of the natural environment, the need for public participation and the need to be accountable for the decisions taken.

The IEM procedure however, does not provide a systematic system by which proactive planning can be assessed and implemented. Therefore, though the procedure advocates proactive creative planning, it only provides a framework for specific development proposals and plans. Land-use planning is the abstract and overarching activity undertaken prior to specific planning. A method is therefore required to systematically assess the more complex and abstract nature of land-use planning.

More specifically, the **IEM principles and procedures** apply to **site specific, project orientated development**, whereas **planning** takes a **broader perspective**. The problem is how to integrate public participation, the natural environment and accountability for decisions made, into a 'visionary' process like planning. The importance of this, is that the final decisions are made by policy-makers, or land-use planners. They make decisions on behalf of society. Thus it is essential that a process in land-use planning is developed that does provide the opportunity to involve public participation both at the initial pre-planning stage, the design stage and the review stage of development planning, i.e. structural or precinct plans.

The lack of a coherent, systematic approach suited for land-use planning was an underlying limitation in establishing a format for land-use planning in the Liesbeeck Black River Confluence Area. The IEM principles and the land-use planning goals however, focused and guided the study, and an approach to marry the two goals was employed.

## 5. THE CAPABILITIES APPROACH

The approach adopted is a land-use capabilities assessment of the Liesbeeck Black River Confluence Area. (See Chap.3; no.2). It has tried to marry the goals of land-use planning and provides a systematic system to achieve this objective. The actual procedure is described in Chap.3; no.4. The manner in which it has attempted to merge the goals of land-use planning and the principles of land-use planning, is described.

In terms of the IEM procedure, the land-use capabilities assessment is **not** an impact assessment. There are no specific development proposals, programmes or plans for the whole area to assess or evaluate. Thus it is neither an environmental evaluation *per se*, as there are no alternatives provided to evaluate. It is however, what IEM advocates; a **pre-planning assessment** of the CA (see Figure 2). Nevertheless, it is responsive to past land-use planning in the CA, where environmental input was ignored in the initial planning and development stages of the area. The assessment therefore, identifies the adequacy of the existing environment, and in doing so has employed the underpinning principles of IEM.

These are described:

- The term 'environment' is used in its broadest sense;
- The information gathered is obtained from the baseline document (MPhil class, 1994), with reference made to specialists, literature surveys and field studies. This provides the basis for informed decision-making;
- Due consideration is given to the recording of a decision and the rationale behind it;
- Public participation was part of the baseline study; this provided the basis for public input into the land-use assessment and,
- A positive and proactive approach is employed by adopting a reductionist process, where the constraints to structural development are defined, and the land-use opportunities provided.

In terms of land-use planning, the land-use capabilities assessment (hereafter referred to as the land-use assessment) is informative. It attempts to assess the biophysical and socio-economic 'resources' in terms of their capability to solve land-use problems and satisfy the needs of society. Recommendations are provided enabling planners to determine plausible goals and objectives and to develop and select the optimal land-use alternatives for the CA.

More specifically, this land-use assessment provides insights into variations of the existing environmental parameters in the CA, and determines the inherent capabilities of the existing environments, identifying the intrinsic problems of and opportunities for the CA. It attempts to provide holistic environmental information on the CA, to enable planners to make better, more informed and sensitive decisions (see Figure 2).

The theoretical basis for this study is aligned to the process of evaluation of existing environments identified by Zube 1980. He claimed that "by identifying the adequacy of the existing environments, evaluations point the way to their renovation and rehabilitation, and provide empirical basis for their promulgation and implementation of new approaches to environmental planning, management and design". It also "provides feedback and systematic learning from past experience and guidance for the future".

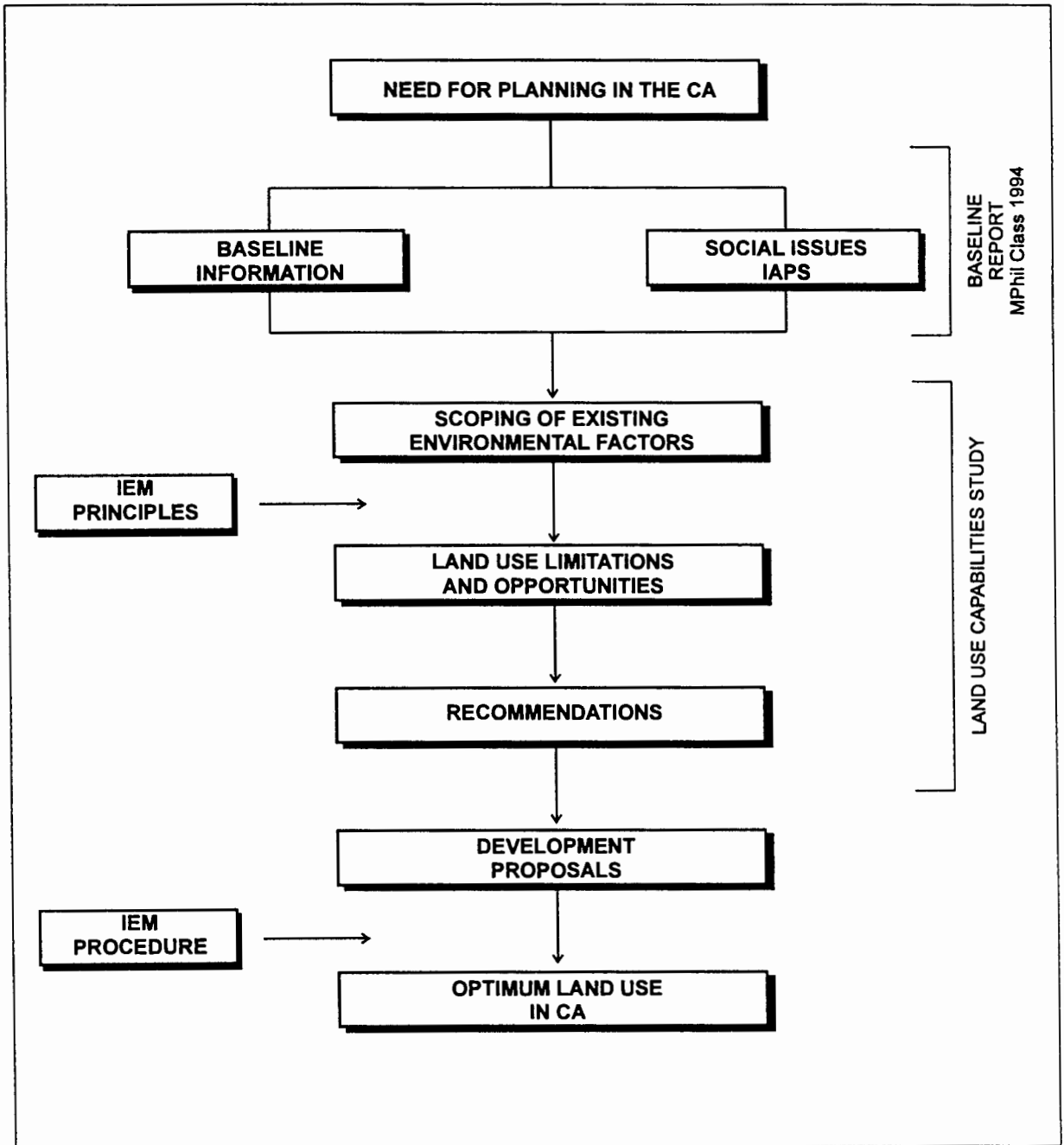
Furthermore, this study sees its task as the challenge of scientists' input in land-use planning as identified by Fabos (1980): "Applied science would be more useful in helping us to determine the carrying capacity or holding capacity of landscapes, or in providing land-use planners with opportunities for growth and options for a greater degree of landscape utilisation, instead of focusing on corrective measures."

In essence, this study intends to provide environmental information to improve the quality of decision-making and ensure that better and informed planning is undertaken.

The approach and methodologies adopted (Chap.2; no.5), the methodologies available for this study, their limitations, the methodologies used to present the approach and the problems encountered, are reviewed in the following chapter.

FIGURE 2

LAND-USE ASSESSMENT IEM AND LAND-USE PLANNING



## CHAPTER THREE

# APPROACH & METHODOLOGY

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### 1. INTRODUCTION

The principles of IEM and the ultimate goal for land-use planning have focused and guided the general approach adopted in assessing the existing environment in the Liesbeeck Black River Confluence Area. These principles, including the theoretical basis are briefly described in the former chapter. The approach employed, the methods available and their limitations to present the information, the procedures followed, and the problems encountered are discussed.

### 2. THE APPROACH ADOPTED

A land-use capabilities approach was employed, to assess the existing environment to identify the inherent constraints and opportunities, so as to point the way to improved and informed planning in the CA. This required that a qualitative rather than quantitative approach be employed and that general criteria be defined. These are discussed once the meanings and relevance of capability and suitability are reviewed.

#### 2.1 Capability and suitability

The terms capability and suitability are both employed in the assessment, with emphasis on the 'use capability', rather than the 'use suitability' of the CA. Theoretically there is a difference of use and meaning. These differences have formed the basis of the assessment and are defined.

“Capability *per se*, refers to the inherent capability, inherent carrying capacity, natural capability, natural carrying capacity, physical carrying capacity, resource bearing capacity and site capacity” (Naveh and Liberman, 1984).

**Capability** in terms of land-use planning generally, refers to **assessments based on inherent or present condition abilities of a resource**. The procedure is the rating of use or productivity potentials based on the present state of the resource. The type of rating used is an assessment based on the resource’s, natural or intrinsic ability to provide for use, and includes that existing ability which is the result of post alteration or current management practices (Naveh and Liberman, 1984).

Whereas capability refers to an environmental parameters inherent or present condition abilities, suitability assessment is the subsequent rating of a land unit under certain uses. The **suitability** procedure rates the **potential ability of an environmental parameter to produce goods and services on the basis of the maximum possible outputs for a given type and level of future alternative sites or resource management inputs** (Naveh and Lieberman, 1984).

In relation to the land-use assessment of the CA, greater emphasis is placed on the capability of the environmental parameters determined in the baseline report. In other words, the **capability of the parameters to provide for a use**, is assessed.

Strictly speaking, capability studies should allow the resources to determine the use. This proved to be ineffectual in the study, due to the varied nature of the environmental parameters, so a land-use was broadly defined as ‘structural development’ (see Chap.4; no.1) By defining a land-use the assessment almost becomes a suitability study. But as there are **no specific management inputs or alternative uses** for the area, a ‘capabilities’ approach has been maintained.

More specifically, the approach refers to **an assessment of the CAs environmental parameters inherent or present condition abilities to provide for structural development**.

The principle behind using this approach, is that by denoting a land-use such as structural development, the inherent **limitations to**, and **opportunities of** the environmental parameters are made apparent. These then point the way to a more suitable land-use. The greater the limitation to development; the greater the opportunity for a land-use that suits its inherent capacity. Hereafter, this is referred to as the 'reductionist process'.

## 2.2 The qualitative approach

A qualitative approach was retained throughout the land-use assessment. The actual procedures refer mainly to the rating and assessment stages of the assessment and are described in Chap.4; no.2 and Chap.6; no.2. There are a number of reasons for this approach. These are presented below.

- The approach enables the main arguments and findings of the study to be communicated intelligibly to the general public, planners and decision-makers. In other words, it presents data that does not hide information in a scientific format. This is important given that the assessment should be understood by non-specialists, the decision-maker, the planner and the developer.
- The approach is in accordance with the principles of IEM allowing for accountability for the rationale, the criteria and the decisions made and for the information on which they are based.
- By allowing for accountability for decisions made and the information on which they are based, the approach enables the re-assessment of the CA. This flexibility is important, given that planning criteria are continually changing, as they are affected by political, economic and social pressures.
- The approach allows for an assessment of the interdependence, interactions and chains of relation between the environmental parameters in the CA.

To conclude, a qualitative approach is comprehensive, informative and adaptable in its methodology, and for these reasons it was employed in this study.

## 2.3 Overarching criteria

Three sets of overarching criteria have been identified as being implicit to the land-use assessment of the CA. These have been adopted from the criteria used in resource management, and suited to assess the inherent capability of the environmental parameters and controlling factors to support structural development.

- The efficiency criterion: This considers whether and to what extent the total benefits of structural development would exceed the total costs.
- The efficiency criterion: This considers the extent to which different individuals or groups comprising society would be better off by structural development.
- The sustainability criterion: This considers the extent to which future generations would be made better or worse off by structural development.

These are not specifically employed in the procedure, but are implicit throughout the land-use assessment. Specific criteria according to the ratings of the individual environmental parameter are explicitly identified in the assessment sections (see Chap.4, no.2; Chap.5, no.2 & 3; Chap. 6, no.2).

## 3. THE METHODOLOGIES AVAILABLE

The main methodology available for the land-use assessment, appeared to be an overlay technique. The meaning, advantages and disadvantages of this technique are described. The Swartkops River Basin evaluation technique, an applied example of this technique, is also outlined.

### 3.1 The overlay technique

“The use of maps in land-use planning is a *sine qua non*, and the superimposition of maps showing different characteristics of an area, in order to see spatial coincidence and variations is a very old technique” (Fuggle, 1992).

The overlay mapping technique was initially introduced to address the complex decisions to be dealt with at a regional level of planning. It allowed for the combination of related categories which indicated both the finer distinctions between land-uses and resources and the attempts to resolve conflicts by analysing the relationships between different types of land-use. McHarg's (1969) overlay method of composite suitability mapping has served as a 'landmark exposition'. The reasons for this attribute to the underpinning principles, comprehensive methodology and a number of other advantages.

The principles underpinning McHarg's approach are that the natural and social processes should be viewed as social values and that these are ranked according to the level of suitability; the objective being to seek **maximum social benefit** and **least social cost**.

The methodology is comprehensive and consists of six basic tasks of overlay mapping.

- to select the controlling factors for mapping;
- decide on the criteria for development suitability for each factor;
- data collection;
- production of a suitability map for each factor;
- synthesise all the data into a project suitability map and
- the presentation of the results.

The advantages of this approach, is not simply that it is comprehensive, but that:

- spatial data are turned into information;
- the mapping technique allows for direct presentation of summarised data, which can be easily presented and interpreted;
- the technique is open-ended and flexible, so that the combination of characteristics might be considered, i.e. the interdependency of the environmental parameters;
- the technique adopts a qualitative approach, which allows for more flexibility in judging comparability of the environmental factors, and for further investigation and discussion about the study site within its local and regional context.

The approach, however, is not without its limitations. By recognising its disadvantages mitigatory measures can be employed. The principle disadvantages of this overlay technique are described.

- Only a limited number of environmental parameters are used.
- The methodology does not lend itself to examine all the considerations, as this would be ineffectual and too unwieldy. (This does however, allow for scenario testing.)
- Expert evaluation to determine the key factors and the ratings of the key factors, controls the outcome and may hide the ranking and weighting used in the technique.
- The mapping system is also imprecise, in that the ecological boundaries are not linear.
- The mapping technique fails to consider the non-spatial variables or second or third order interactions.

Based on the underpinning principles of seeking maximum social benefit and least social cost, the comprehensive methodology and the listed advantages, the overlay technique appeared to be the best suited for initial pre-planning land-use studies. It was therefore adapted for this land-use capabilities study and the disadvantages have been accepted as limitations. Where possible, modifications have been undertaken.

Ideally, GIS overlay mapping techniques would have been more suited to the needs of this land-use assessment, but the resources of this study precluded this option. It is however, important to recognise the value of the GIS, presently used for landscape planning.

GIS is a newly acquired mapping tool, which has given life to the overlay technique (Fabos, 1985). This is a form of computer based analysis, and allows for a large data bank, manipulation of the data to provide for a number of different scenarios and an efficient system for producing maps. In addition the system is based on quantitative data, which negates the problem of subjectivity. New systems are being developed to work out techniques to overcome information that cannot be quantified, such as societies ever changing values.

### **3.2 The Swartkops River Basin evaluation study (1979)**

The Swartkops River Basin (SRB) evaluation study, a pre-planning land-use study, was undertaken in 1979 by Hill, Kaplan, Scott and Partners. This evaluation successfully adapted the overlay technique for its use in determining optimum land-uses. The general approach provided a useful and comprehensive evaluation technique. The evaluation procedure required five comprehensive steps. These have guarded the approach employed for this study and are described.

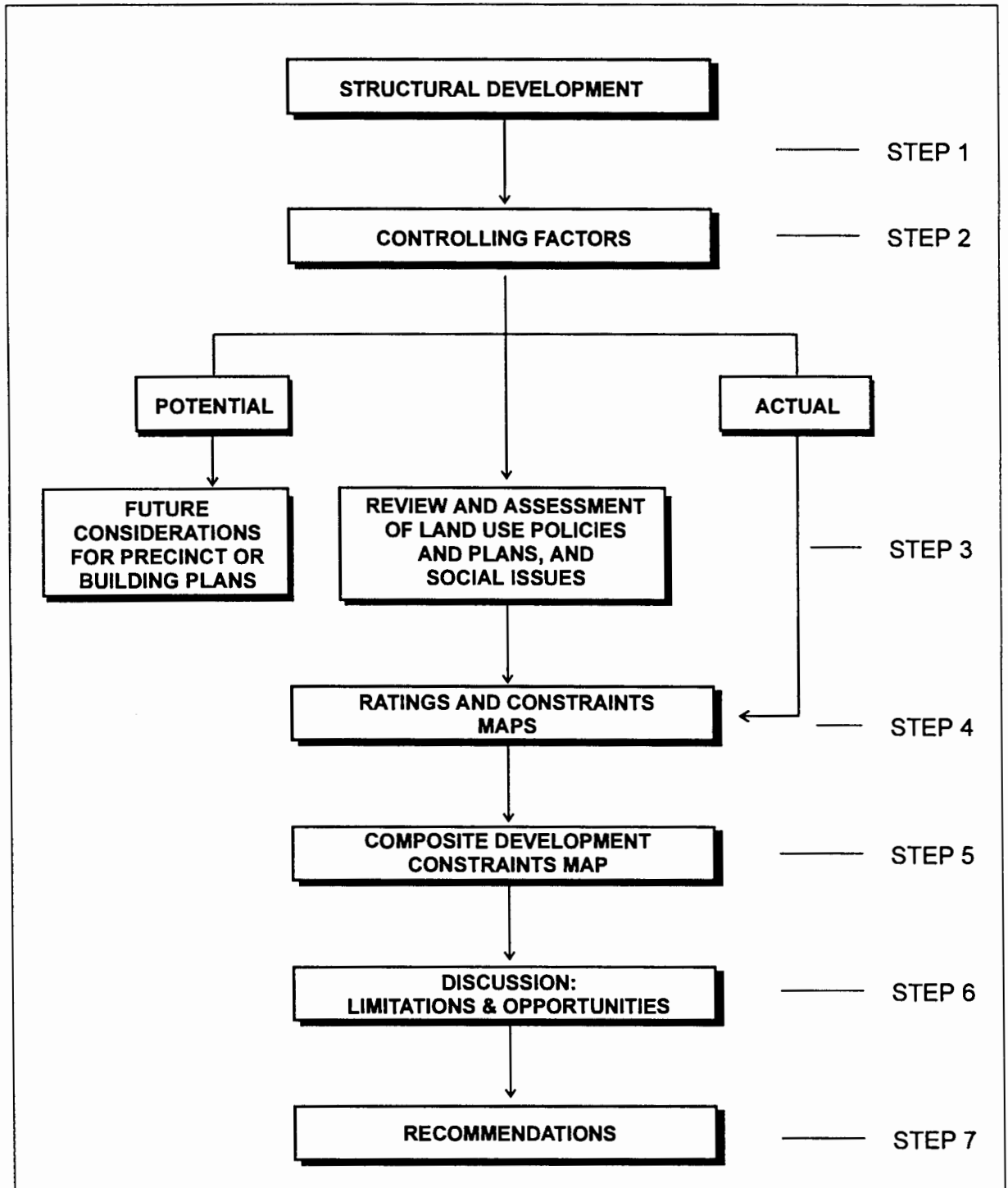
- Land-use activities be identified to denote the technical suitability of the land for any major development;
- The controlling factors which are considered to govern the intrinsic suitability of the various parts of the study area for certain types of development, be identified;
- These controlling factors were then rated according to how large or small a problem they posed for the various types of development throughout the study area;
- The information was then presented in a series of land-use activity maps, prepared by overlaying the ratings of the appropriate controlling factor in each part of the study area and
- The consequences that could arise from the establishment of a particular type of development in an area were described.

The SRB approach, however, did not quite fulfil the requirements of the land-use assessment. It did not specifically take account of the artificial activities present or the socio-economic factors which affect the area. It also focused on the 'use suitability' of the SRB for pre-determined land-uses. In essence therefore, it was a land-use suitabilities study.

Accepting this 'use suitabilities' approach, the SRB procedure proved to be a useful tool in guiding the land-use capabilities approach of this study. The procedures adapted are described in Chap.3, no.4.

**FIGURE 3**

**LAND-USE ASSESSMENT PROCEDURE**



#### **4. THE PROCEDURE**

The land-use assessment is based upon the inherent capability of the environmental parameters to support structural development. As mentioned in Chap.3, no.3.2, the approach and procedures of Swartkops River Basin evaluation (1979) provided a systematic format for the land-use assessment. The latter has been adapted and the actual procedure is described.

The land-use assessment is a seven step process:

- It begins by defining a land-use e.g. structural development.
- The controlling factors are then determined. These are the environmental parameters considered to govern the present or potential intrinsic capacity of the CA for the location of structural development. The process and criteria for the rating are described in Chap.4, no.2.
- The land-use policies and plans and the social issues are reviewed and assessed.
- The actual controlling factors are then rated according to the constraint they impose on structural development in the study area. The constraint is determined by a range of values, and are outlined on a constraints map.
- A composite development constraints map is provided. This identifies the areas intrinsically not suited to structural development. The information from the map is then discussed according to defined land units, and the final findings presented in a summary table.
- The limitations to, and opportunities for structural development in the CA, according to the predetermined land units, are determined.
- General recommendations are provided in terms of the opportunities for the land units.

The exact procedures and problems encountered for each 'step' are provided in the Chap. 4, no.2; Chap.5, no.2, & 3; Chap. 6, no.2. The major problems of bias and decision-making are discussed.

## 5. THE BIAS AND DECISION-MAKING PROBLEM

There are inherent problems identified in the general approach. These apply to the notion of bias and decision-making and the mapping technique. The latter problem is discussed in Chap.3, no.3.1. The former becomes most apparent when rating the environmental parameters, and assessing the controlling factors. They (bias and decision-making) are however, implicit throughout the study and are discussed.

“The notion of objective judgement is an illusion...but by recognising biases and how they affect decisions, their detrimental effects may be overcome” (Miller 1985).

The author tried to assess and interpret the information provided in the baseline report in the most objective manner possible. Nevertheless, it became apparent that subjective analysis was unavoidable. This may be attributed to the fact that environmental judgements are often affected by biases (McAllister, 1980).

Biases arise as a result of attempts to simplify complex problems. Humans are only good at solving problems with well defined boundaries (McAllister, 1980). As environmental decisions are generally of a more abstract and complex nature, heuristic devices (rules of thumb, or ‘gut feelings’) are often used in an attempt to simplify the problem. The ‘heuristic’ approach was inevitable, given the complex nature of the environmental parameters and the scope of this study.

In theoretical terminology, this form of bias may be considered a ‘cognitive bias’, i.e. bias was a function of the limited success in objectively analysing the data (McAllister, 1980). This may be attributed to the availability and representativeness of the baseline information. Thus bias may also be a function of the rationale adopted in determining the criteria to analyse the baseline data.

“Rationality itself is not an absolute in decision-making” (Hollick, 1981a). This means that given the same information, different people will make different decisions, based on what

they see to be rational. An engineer for instance, may make his decision based on achieving his end goal; whereas an ecologist may base decisions on conserving and enhancing the natural environment, considered to be ecologically rational. The rationale chosen affects the criteria selected and the value judgements during the decision-making process.

As an 'Environmental Scientist', an ecological rationale could have influenced the ratings in this assessment, given that subjectivity is unavoidable. The informal, qualitative approach attempts to present openly the criteria and justifications used, and allows for review. Nevertheless, the implications for this are that the final recommendations for the CA, could have an ecological bias.

Having discussed the approach adopted, the methodologies available and their limitations, the procedure, and the problem areas of the approach, the controlling factors are identified in the following chapter.

## CHAPTER FOUR

# THE IDENTIFICATION

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### 1. INTRODUCTION

The controlling factors are identified by assessing all the environmental parameters to ensure that only the significant factors are determined. To begin with, a land-use option is defined, i.e. structural development and the meaning and reasons for determining the controlling factors are described. The methodology and the presentation used for identifying the controlling factors is then provided, prior to the actual assessment being presented.

#### 1.1 Structural development

Capability studies require that an assessment is based on a 'resources' inherent, natural, or intrinsic ability to provide for 'use' (Naveh and Lieberman, 1984). Given that the study area is not strictly an undeveloped land unit, all the environmental parameters defined in the baseline report are referred to as the 'resources'. These are biophysical and socio-economic factors, which could inherently provide many diverse land-use alternatives. For this reason, it was deemed necessary to define a land-use, in order to assess the CA effectively.

For the purpose of this land-use assessment, 'structural development' has been adopted as the land-use. This is non-specific, and tries to encapsulate the economic and social needs of society, i.e. housing, education and job creation. In other words, it manifests the transformation of the existing, relatively open-space landscape, into a built-up urban landscape, which will accommodate the socio-economic needs of society. No differentiation is made between the capability of the land for the various types of building use (i.e. residential,

commercial, light industrial or institutional) or for the various sub-types of building use (i.e. high income residential, sub-economic housing) which may require specific conditions.

The heavy industrial land-use option is however, excluded in the definition as the area falls within the 'Smokeless Zone'. Light industry is nevertheless, retained, given that this land-use activity is presently being undertaken in the Maitland Residential and Industrial area.

The term 'structural development' is used interchangeably with 'development', unless otherwise stated.

## **1.2 The definition of the term 'controlling factor'**

In order to facilitate further assessment, the controlling factors have been determined. This is a process of scoping, whereby the scope of the assessment is narrowed down, which ensures that the assessment remains focused on the truly significant controlling factors and issues (Dept. Env. Affairs, 1992).

Controlling factors are the environmental parameters which are considered to govern the intrinsic capability of various parts of the study area for the location of structural development. To provide some sort of weighting in terms of their present and future capability, these were grouped into actual and potential controlling factors according to the influence they presently and potentially exert for the location of structural development. These are described:

- Actual factors are those that presently pose greatest influence on structural development.
- Potential factors are those which could pose future influences on structural development.

The environmental parameters which have not been identified as either actual or potential controlling factors are described and any inter-relating influences presented.

The actual factors will then be rated according to the constraint they impose on development. The potential factors however, are identified to provide insight for future development planning and design.

## **2. THE METHODS AND PRESENTATION**

The baseline information report (MPhil class, 1994) presented a preliminary synthesis of all the primary environmental information. This provided the principal information source (biophysical and socio-economic) for identifying the controlling factors.

The environmental parameters are those presented in the baseline report. These have been broadly defined as the physical, biological and historical aspects, the present land-uses and ownership, the land-use controls, land values and the existing infrastructure.

Each environmental parameter is discussed and rated and the actual and potential controlling factors identified. In order to rate the identified parameters two types of criteria had to be determined; the standards of comparison and the standards of values. These are discussed and the problem areas are described.

### **2.1 Standards of comparison**

The rating process requires that the environmental parameters be measured in reference to some standard of comparison, referred to as criteria. In other words, criteria of some form are needed to determine the intrinsic capability of all the environmental parameters to support structural development.

The overarching criteria of efficiency, equity and sustainability are implicit in rating the environmental parameters.

Each environmental parameter is considered in terms of:

- its present *efficiency*, and whether or not its existing use capability could be improved by structural development, i.e. would the benefits of structural development exceed the costs?
- its present *equity*, and whether or not this could be improved by structural development, i.e. would structural development distribute the benefits and costs fairly among the present day society?
- its present *sustainability*, and whether or not this could be improved by structural development, i.e. would the benefits of structural development continue to exceed the costs over intergenerational time periods?

## 2.2 Standards of value

The rating of each environmental parameter against the above criteria is expressed as a 'standard of value', i.e. hazards, resources, fixed uses, essential services, legally binding and sensitive issues. These are described.

- Natural hazards pertain to the environmental parameters which are inherently hazardous to human life and property;
- Potential hazards pertain to those environmental parameters which are hazardous to human life and health due to specific human action, such as water pollution.
- Scarce resources refer to the environmental parameters which are irreplaceably unique and scarce.
- Sensitive or vulnerable resources refer to the environmental parameters where unregulated utilisation will result in social cost and loss of the resource.
- Unconditionally fixed features refer to the environmental parameters which are absolute in terms of being fixed in state or structure.
- Essential or indispensable services refer to the environmental parameters which are absolute in terms of providing essential goods and services, where transferal or disposal will result in high social and financial cost.

- Legally binding policies and plans refer to the environmental parameters which are absolute in terms of their legal and administrative requirements.
- Sensitive issues refer to the environmental parameters which are identified as concerns or issues.

In presenting the information for the controlling factors, it could be argued that a negative stance has been adopted, where the hazardous factors, scarce resources, sensitive areas or issues, or legal or structural constraints have been identified. This is attributed to the underlying 'reductionist process' (see Chap.3, no.2.1).

The format used in presenting the data should not however, be regarded as an anti-development bias. By specifying the factors of greatest influence, i.e. the problems, areas of concern and structural or legal constraints, future decision-makers and land-use planners may be able to identify the inherent capabilities of the controlling factor, and their suitability for a different land-use. Constraints are not necessarily problems; they are opportunities for a different land-use, better suited to the intrinsic nature of the controlling factor.

### **2.3 Determining the values**

The standards of value presented for each environmental parameter are determined by professional and informed judgement of the author. This is predominantly founded on three information sources from the baseline report. These are:

- The simple assessments of the environmental components in the study area, which used criteria appropriate to each component;
- The present land-use policies and plans provided information about the regional and metropolitan aspects which influenced the study site, and
- The social issues and concerns raised by the I&APs.

In addition, personal experience, extensive site visits and investigations and personal involvement in production of the baseline report, provided an essential ingredient in

undertaking the value judgments. Further literature and specialist information was also sought to clarify areas of uncertainty.

With a few exceptions however, the value judgement made by the author corresponds with the simple assessment of the environmental parameters provided in the summary sections of the baseline document.

There are recognised problems in determining the values. The main ones have been identified as:

- The summary sections in the baseline report were undertaken by the study team resulting in a certain amount of subjectivity;
- The issues raised by the I&APs are regarded as being true. These however, have not been reviewed by the I&APs themselves, and
- Professional and informed judgement may have been influenced by personal rational.

In order to overcome these limitations a major public participation exercise should have been undertaken, whereby the views and values of the affected society could judge the influence of the environmental parameters on land-use planning. Practically however, this was impossible given the limited resources available to this study.

## **2.4 The Presentation**

The overall approach in presenting and analysing the environmental parameters, is largely qualitative and descriptive. This was deemed to be the most efficient, comprehensive and adaptable method of presentation and assessment (see Chap.3, no.2.2.).

The format is adopted from the planning process of terrain analysis, used by land-use planners and landscape architects, whose primary objective is to interpret and understand, at the local and regional context, the biophysical and socio-economic characteristics of any study area (Oberholzer, 1992). This format was adapted to suit the needs of this assessment.

The assessment was undertaken in a sequential, rather than haphazard, manner. The generic components of the natural landscape were analysed first, such as climate and geology, as these determine all other natural features, such as hydrology, topography, soils, flora and fauna. Past and present land-use, land-use controls, and existing infrastructure were then considered.

The rating process of the controlling factors involves three main inter-leading stages. These are described below.

- The '*brief*' is presented as a question and sets out the objective of the assessment.
- The '*inventory*' is divided into three sections. A brief '*description*' of the environmental factor is provided, and summarises the inherent characteristics of the environmental parameter. The issues raised and information provided by the I&APs is then presented. Lastly, the land-use policies and plans which currently influence the environmental parameter are discussed.
- The '*interpretation*' is the final analysis and evaluation of the environmental parameter. This is undertaken by professional judgement with implicit consideration of the criteria presented in Chap.3, no.2.3. Reasons for the values given to each environmental parameter are presented and discussed in terms of their existing or potential influence, and the controlling factors are selected.

Summary tables are used to present the synthesised information. There are two tables, one of the actual controlling factors and a second one presenting the potential controlling factor. The reasons and values given to each controlling factor are also presented.

### **3. THE IDENTIFICATION**

The environmental parameters are assessed in categories as defined in the baseline report. The physical and biological features are initially assessed, followed by the socio-economic factors of historical and archaeological features, present land-use and landownership, present land values, and existing infrastructure.

### 3.1 The bio-physical features

#### 3.1.1 The physical features

##### (a) CLIMATE

###### *Brief*

Is the climate in the CA a controlling factor for structural development?

###### *Inventory*

###### Description:

The climate in the CA is the Mediterranean climate of the Western Cape, characterised by hot, dry summers and cool, wet winters. Within this general climate zone, the CA has its own distinctive micro-climatic characteristics. Precipitation is regarded as being heavy to moderate in the study area, with maximum fall in the winter period.

The average wind speed in the area is above the average of the CMA at over 60 kms/hr. Temperature inversions, common to the Cape Flats especially in winter, are also found in the CA.

###### Issues raised by the I&APs:

The wind speed in the area could influence the height of the buildings.

###### Policies and plans:

The only policy that relates to the area, and then only indirectly, is its 'Smokeless Zone' designation.

###### *Interpretation*

The micro-climate of the study area is not inherently hazardous to human life, but the high wind speeds could inhibit the construction of high rise buildings. These winds may also influence erosion, litter transportation and air pollution in the area.

*Climate* is not an existing significant hazard, nor a scarce nor sensitive resource, and therefore is *not a controlling factor* for structural development in the CA.

**(b) GEOMORPHOLOGY, GEOLOGY AND SOILS*****Brief***

Are geomorphology, geology and soils existing constraints for land-use options in the CA?

***Inventory*****Description:**

The area is predominantly underlain by the Tygerberg Formation of the Malmesbury group, a common geological feature in the Cape Flats area. Shale outcrops and greywacke (a finer grained variety of sandstone) have intruded or overlain the baserock. These areas are situated between the Black River and Old Liesbeeck River, and on the higher ground on the eastern and northeastern areas of the CA. Alluvium deposits are found along the river edges. Ferricrete is found sparsely in the CA. The Transnet and SARCC land currently occupied by the Liesbeeck Sportsgrounds, is a reclaimed area. Its underlying soil composition consists of ash, rubble and refuse. This is referred to as 'fill' or 'infill'.

**Issues raised by I&APs:**

The potential leaching and unconsolidated structure of the infill area was a concern.

**Policies and plans:**

There were no specific policies or plans identified which relates to the geomorphological, geological or soil in the CA.

***Interpretation***

Alluvium could influence land-use options due to their compaction potential (low bearing capacity) and shallow depth of the soil. Ferricrete, on the other hand could be used for construction purposes, but is only sparsely found in the study area. The infill area, could influence land-use options in the area due to its unconsolidated structure.

The shale outcrops and greywacke areas are geologically the optimum areas for development. They are, however, occupied by the Valkenberg Hospital, SAAO, Maitland Garden Village and ACRC, and therefore fixed, which has implications for present and future land-use in the study area.

*Geomorphology, geology and soils* in the CA are not inherent or potential hazards, nor a scarce or sensitive resource. They are therefore, *not* considered to be *controlling* factors. The 'infill' area is a *potential controlling factor*, due to its unconsolidated nature, and the fact that it was raised as an issue by the I&APs.

**(c) TOPOGRAPHY*****Brief***

Is topography an inherent or potential hazard to land-use options in the CA?

***Inventory*****Description:**

The CA is characterised by gently undulating slopes, and the low-lying areas, mainly located in the north-western area and along the water courses, fall below the 5yr flood level. The highest areas correspond with the Malmesbury Shale outcrop and greywacke and quartzite sandstone.

**Issues raised by I&APs:**

Topography was not a concern of the I&APs.

**Policies and plans:**

The Cape Town Metropolitan Area (CMA) Guide Plan restricts urban development on the areas judged by the Administrator to be a floodplain. It also discourages urban development on slopes steeper than 1:6.

***Interpretation***

The gently undulating characteristics of the area do not influence land-use options in the study area. The low lying areas however, fall below the 1:5yr floodline i.e between 0-5 metres amsl., and are therefore an inherent hazard. The CMA Guide Plan restricts urban development in the areas designated as a floodplain.

*Topography* is *not* identified as a *controlling factor*, but it does have implications for flooding in the CA.

**(d) HYDROLOGY*****Brief***

Is hydrology in the CA an inherent or potential hazard, or scarce or vulnerable resource?

***Inventory*****Description:**

The Liesbeeck and Black Rivers flood 2 to 3 times a year in winter. The canal flow in the Liesbeeck river rises above the canal capacity by 10%, which leads to flooding of the Liesbeeck Sportsgrounds. This is further intensified by urbanisation and hardening of the catchment area, canalisation and channelisation of the river and the backing up of the Black River in winter or during spring tides.

The Black River floodplain in the study area is characterised by a high water table and seasonal water bodies. Increased rainfall in the catchment areas and the study area, hardened catchments and stormwater increase the level of the waterbodies and channel flow. The sewage works at Athlone and Borchard's Quarry, which accept domestic and industrial effluent and discharge the treated and semi-treated effluent into the Black River, also increase the levels of the waterbodies and channel flow of the Black River. There is the potential that this may exceed the current flood capacities.

The main areas affected by the present flooding problems are the Liesbeeck Sportsgrounds, a small section of the SAAO, most of the undeveloped land controlled by the CCC and along all the river banks.

Flooding is however, a fundamental resource for the wetland habitat, i.e. Raapenberg Bird Sanctuary and the Pallotti, Varsvlei, Rosenfontein wetlands. Flooding is an essential part of the rivers natural cycle, as it cleanses the river system.

#### Issues raised by the I&APs

Most of the I&APs were aware of the issue of flooding of the CA. The validity of the flood levels in the CA has been questioned by local residents, claiming that flooding occurs more frequently than implied by the existing floodlines. There is also, concern that flooding of the Black River is going to increase with the continued hardening and development of the Cape Flats. River management was also considered to be inadequate in the CMA and the CA. It was recognised that there was a need to upgrade the catchment management schemes for the Black and Liesbeeck Rivers; but there were conflicting opinions as to how this should be undertaken, i.e. hard engineering solutions such as canalisation, or soft engineering solutions, such as wetlands conservation, which allow for the natural event of flooding.

#### Policies and plans:

The CMA Guide Plan restricts any form of urban development on areas judged to be a floodplain.

#### *Interpretation*

The Liesbeeck and Black Rivers flood 2 to 3 times each winter. Flooding is therefore an inherent and potential hazard to developments and potential developments located along the Liesbeeck and Black River. Flooding is also a sensitive issue among the I&APs with regards to present and future river management, flood levels and flood control methods. Furthermore, it is illegal, according to the CMA Guide Plan, to develop in areas located below the 1:50yr flood line.

*Flooding* is an inherent and potential hazard to in the CA, and a vulnerable resource for wetland habitat, and the natural cycle of the river. Flooding is thus an *actual controlling factor* for development.

### 3.2.2 The Biological Environment

#### (a) **FLORA**

##### *Brief*

Is the flora in the CA a scarce or vulnerable resource?

##### *Inventory*

##### Description:

Most of the CA has no floristic value, consisting almost entirely of alien species. The only areas of botanical interest are the 30 ha of wetlands that occur in the study site. These contain a large proportion of indigenous reed, grass and sedge species. The Raapenberg Bird Sanctuary north site (see Map 2) is perhaps the most important as it has the highest proportion of indigenous species and habitat types (temporary pools, pans, reed-beds and mud-flats) of all the wetlands in the CA.

##### Issues raised by I&APs:

Conflicting views on the issue of conservation of the natural environment in the CA were raised. Some regarded conservation as an important concern, while others felt that it was a luxury that the country could hardly afford.

##### Policies and plans:

The CMA Guide Plan, the Greening of the City Report (Greening Report), the Interim Metropolitan Development Framework (IMDF) and the C-BR study support the idea that areas judged to be of natural assets should be retained.

##### *Interpretation*

The flora *per se* in the CA is not a scarce or vulnerable resource. The wetland areas however, are of biological significance most especially in the Raapenberg Bird Sanctuary north site. These areas do represent a scarce or vulnerable resource, given that wetlands are threatened areas in the Cape Town metropolitan area. They can therefore be considered as conservation worthy.

*Wetlands are an actual controlling factors.*

**(b) FAUNA*****Brief***

Is the fauna in the CA a scarce or vulnerable resource?

***Inventory*****Description:**

There is little information available on the amphibian, reptile, fish and mammal life in the study site. It is unlikely, however, that there is anything of great conservation significance.

The area, supports a total of 102 recorded bird species, the majority of which are waterbirds. These birds represent about 60% of all the waterbirds known to occur in the southwestern Cape. Few of the remaining bird species are of regional and national importance. However, as the population numbers have decreased since the 1960s, those species remaining have become more significant in terms of their conservation worthiness. In addition, there are a few remaining individuals, which use the area and are likely to be of regional and national importance (Red Data species), such as the White Pelican.

The remaining wetland areas in the study site, once part of an extensive wetland system, also function as important refuge, feeding and gathering areas for the waterbird populations. Therefore, in a regional context, these areas are important stop-over points for bird movement between the other wetlands in the CMA.

**Issues raised by the I&APs:**

Differing opinions about the conservation worthiness of the avifauna and the wetlands were presented.

**Policies and plans:**

The CMA Guide Plan, the Greening Report, IMDF and the C-BR study recognise the need to protect and conserve areas deemed to be national assets.

***Interpretation***

Fauna *per se* is not scarce or vulnerable resources as there are few, if any, remaining species of conservation significance. It is *not* a *controlling factor*.

Avifauna is considered to be a potential scarce or vulnerable resource, as bird populations have been decreasing. Similarly, the CA does support a number of species whose numbers are declining in the southwestern Cape, i.e. the White Pelican. These low bird populations though, are dependent on the wetlands in the area for refuge, feeding, breeding and nesting. The wetlands are remnants of a once extensive wetland area, and these areas are declining with increasing urbanisation and development. Thus, the remaining populations are threatened by habitat destruction. The species richness and bird densities of the Black

River wetlands however, compare favourably to two other wetland systems in the Peninsula and vicinity and are Rondevlei and Rietvlei. Thus, despite the extensive modification and degradation, the wetlands are a rich avifauna habitat.

The *avifauna* is considered to be a potentially scarce and vulnerable resource, thus is a potential controlling factor. The wetland habitat, given its regional and biological significance, is a vulnerable and scarce resource, thus an *actual controlling factor*.

### (c) POLLUTION

#### *Brief*

Are air, noise, water and terrestrial (litter and infill) pollution in the CA inherent or potential hazards?

#### *Inventory*

##### Description:

Air and noise pollution in the study site are mainly influenced by traffic movements on the three surrounding highways. The area is also located in the 'Smokeless Zone' which indicates that air pollution has been recognised as a localised problem.

The levels of pollution (organic and inorganic) in the Liesbeeck and Black Rivers are too high, affecting both the aquatic life and the recreational potential of the rivers. Mitigatory measures are needed to reduce these levels, but are feared to be very costly.

Terrestrial pollution is aesthetically unappealing. Litter pollution occurs throughout the study area. The soil pollution of the infill areas (mainly Transnet and SARCC land) is unknown.

##### Issues raised by I&APs:

Air and noise pollution are not regarded to be an important issue in the study area. There are conflicting views regarding the water quality of the rivers in the study area. There are those that believe the Liesbeeck Lake should be used for recreational purposes (Dare, pers. comm., 1994); whereas there are other I&APs who believe that the Black River is the most polluted in the CMA (MPhil class, 1994). There is general concern that litter pollution should be dealt with immediately, and that the constitution and toxicity of the infill area be determined.

##### Policies and plans:

The CA falls within the 'Smokeless Zone'. The CCC recommends that water contact sports be prohibited, and recognises that the litter problem on the Liesbeeck River as an important issue (Boddington, pers. comm., 1994).

### *Interpretation*

Any future developments would have to comply with the standards established in the 'Smokeless Zone'. *Air pollution* is a potential, not existing hazard, to human life and health in the study area. If the area is demarcated an industrial development area, then the existing legislation should be considered, and adhered to. For these reasons, air pollution is assumed to be a *potential controlling factor* for future land-use options.

*Noise pollution* created by the traffic is not an existing hazard to human life or health in the CA. Mitigatory measures for developing the area are possible. For these reasons noise pollution is *not* regarded as an actual or potential *controlling factor*. The proximity of any future development to the highways could reduce the level of noise pollution in the core of CA.

Despite the expensive efforts by the City Council to improve the quality since 1979, water quality of the rivers is still very low. The present quality and estimated cost of improving the water quality, has implications for the type of activities that are feasible for riverside development, and especially for recreational use. *Water pollution* is thus, an inherent constraint constituting a hazard to human health and well-being in the study area. It is also an inherent ecological hazard, as the high nutrient levels and high concentrations of trace metals, affect the structure and functioning of biotic communities, and the species richness, diversity and composition.

Water quality of the rivers therefore, especially the Black River, is an inherent hazard and might be considered an actual controlling factor. It has however, been classified as a *potential controlling factor*, given that structural development pertains to terrestrial development, rather than aquatic development. Water pollution does have implications for water-use options in the CA.

*Litter pollution* is most prominent in the rivers, and there is concern that this should be controlled and improved in the near future. The pollution caused by the infill area (Transnet and SARCC land) is presently unknown and could have hazardous implications in terms of leaching pollutants into the Liesbeeck and Black River. In addition, there is the view that the site should be investigated prior to development. No other forms of terrestrial pollution were considered. Therefore, it can be concluded that terrestrial pollution is not an inherent or potential hazard; it is thus *not* considered to be a *controlling factor*.

## 3.2 The socio-economic factors

### 3.2.1 Historical aspects and archaeological sites in the CA

#### *Brief*

Are past developments, historical aspects and archaeological sites pertaining to the study area actual or potential controlling factors?

#### *Inventory*

##### Description:

The natural environment has formed the basis of the past and present historical development. The remnants provide a richness of character to the area. The area forms part of the first meeting place of the Settlers and the local indigenous inhabitants in the Cape, where landownership became a contentious issue. There are four National Monuments in the study site; Valkenberg Homestead, the Main Administrative building of Valkenberg Hospital, Nieuwe Molen in the ACRC area, and the SAAO main building. There are also a number of National Monuments in the surrounding area. Archaeological investigations have been restricted due to the disturbed nature of the study site. There are though a number of potentially significant sites.

##### Issues raised by I&APs:

There was general consensus that places of historical and archaeological importance should be conserved, due to their cultural and social values to society. The current approach to conservation of the historical buildings was identified as being inefficient.

##### Policies and plans:

The CMA, IMDF and the Peripheral Planning Initiatives call for the conservation of historical significant features.

#### *Interpretation*

There are a variety of existing important historical and archaeological features in the CA. These provide society with a 'sense of place' and culture, and are unique and vulnerable resources. Additionally, the I&APs recognised the need to conserve areas of historical or archaeological importance, for present and future generations.

*Historical and archaeological sites are actual controlling factors.*

### 3.2.2 Land-use and ownership

#### *Brief*

Are the present land-use and ownership in the CA actual or potential controlling factors.

#### *Inventory*

##### Description:

Structurally, the study site is characterised by low density buildings mainly used for institutional purposes (Valkenberg Hospital, ACRC, SAAO, Vincent Pallotti Hospital). There are a few areas used for residential purposes (Maitland Garden Village and Maitland Residential Area) and commercial purposes (UCT Courtyard development, and Maitland industrial area). The majority of the area is used for recreational use (RBS, Liesbeeck Sportsgrounds, Peninsula Golf driving range) and thus has retained an ambience of open space; an important factor considering its proximity to Cape Town and the densely built surrounding areas.

##### Issues raised by the I&APs:

There is general consensus that the present land-users and landowners are key I&APs, in that they have a right to determine future land-use planning in the area. There were conflicting views about public rights and State Land, and the question of public land disposal. This became most significant in relation to the two of the largest landowners; the State and Transnet properties. There is agreement that current methods of public land disposal are problematic.

##### Policies and plans:

There is a moratorium on State Land disposal in Cape Town.

#### *Interpretation*

Present land-uses are assumed to have varying levels of fixed status in terms of their physical and structural characteristics, and local and metropolitan context. In addition, the land-uses provide essential services and resources, such as the provision of medical aid for the mentally handicapped (ACRC and Valkenberg Hospital) and, for recreational use and conservation of the natural species such as the Raapenberg Bird Sanctuary. Land-uses have varying degrees of fixed uses of vulnerable and scarce resources and services, all of which are important considerations for development in the CA.

Furthermore, the question of State and public land disposal, especially Transnet and the State, is a sensitive issue in the study site. Given the potential demands that could be made from a newly formed private company 'Transnet' and the overriding needs of the CMA, i.e. in terms of housing, education,

recreation and job creation, this issue is critical. The question of public land disposal is thus an actual issue for structural development.

*Land-uses and landownership* are considered to be *actual controlling factors*.

### 3.2.3 Land-use controls: Zoning and rezoning

#### *Brief*

Is the zoning system an actual or potential controlling factor for structural development in the CA?

#### *Inventory*

##### Description:

The Zoning Scheme controlled by the CCC, and administered in terms of Land Use Planning Ordinance LUPO (15 of 1985), is the only land-use control mechanism in the CA. It is legally binding, and establishes a number of rules and regulations to an assortment of land-use factors, such as use zones, subdivision and combination erven, coverage, floor area, building and height restrictions, and special areas. The use zones vary in land-use controls; some are more restrictive than others, such as Public Open Space, while others are not, such as General Business. Land-use changes are possible given that the rezoning procedures are followed. These vary for different landowners.

##### Issues raised by I&APs:

There are conflicting views about the appropriateness of the current Zoning Scheme, some calling for a more flexible, proactive scheme.

##### Policies and plans:

The Zoning Scheme should coincide with the broader land-use control set out in the CMA Guide Plan.

#### *Interpretation*

Zoning is presently the only existing land-use controlling mechanism in the study site and is legally binding. The efficiency and effectiveness of the Scheme has been questioned, thus is a sensitive issue among the I&APs.

*The zoning system* is considered to be an *actual controlling factor* for structural development in the CA

### 3.2.4 Land values

#### *Brief*

Are the land values of the area actual or potential controlling factors for structural development in the CA?

#### *Inventory*

##### Description:

The land values surrounding the C-BR and CA vary considerably ranging from R157 250 in some areas of Observatory, to R101 000 in Woodstock. The value of non-residential land has shown a significant increase since the 1970's. There are no set land values for the study site, but the UCT Courtyard site is reported to have sold for R1 million, which appears to be below market. The price of land depends on the existing infrastructure, location and the demand.

##### Issues raised by I&APs:

Land values are sensitive issues, and are very changeable. There was concern about the sale price of state lands.

##### Policies and plans:

There were no specific factors identified which influenced the study site.

#### *Interpretation*

Land values are naturally sensitive issues. In and around the study site, land values range from moderate to very expensive, depending on the present land-use and landowner, location, and demand. For these reasons, land values might be considered as actual controlling factors due to their inherent sensitivity and overriding importance.

However, for the purposes of this assessment, land values *per se* have been omitted in the further assessment. They are recognised though as an important consideration and will play a key role in specific project planning in the study area.

*Land values are not a controlling factor.*

### 3.2.5 Infrastructure

#### *Brief*

Are the existing infrastructural components fixed features in the CA; if so, are they considered to be actual or potential controlling factors for structural development?

## *Inventory*

### *(i) Road services*

#### Description:

The three major roads (the Liesbeeck Parkway, the Black River Parkway and the N2 Freeway) which border the study site, provide essential commuter routes to the CBD, for this reason they are indispensable services within the metropolitan area of Cape Town. The smaller roads such as Alexandra Road, Berkley Road and Malta Road, mainly serve the surrounding residential and industrial areas, providing fundamental services to the area. They all constitute a major infrastructural investment by the CCC.

#### Issues raised by I&APs:

Traffic was regarded as problematic in the areas surrounding the study site. There are however, conflicting views as to whether the CA should be used to address the traffic problems in Cape Town. There were conflicting opinions about whether the Malta-Berkley Road Link should be constructed.

#### Policies and plans:

There is, at the metropolitan level, the demand for improved traffic services in the area (CMA Guide Plan, IMDF, C-BR study). The northern section of the study area has been reserved since 1949 for a Malta-Berkley road link. This reservation is currently retained.

## *Interpretation*

Liesbeeck and Black River Parkways, the N2 Freeway and the smaller roads (Malta, Berkley and Alexandra Roads) are unconditionally fixed features, providing essential services at the local and metropolitan context.

In addition, there is an over-arching need to improve metropolitan transportation services. The Malta-Berkley road link and a number of road widening proposals have been suggested as potential services that could alleviate the traffic problem. The road widening proposals have been considered as the most likely scenarios. The financial viability of the Malta-Berkley link proposal has been questioned. Road proposals are therefore sensitive issues that need resolving.

The roads are unconditionally fixed and there is a need for improved traffic services. There are differing road proposals.

The *road services* are *actual controlling factors* for structural development in the CA.

## ***Inventory***

### ***(ii) Rail services***

#### **Description:**

There are no rail services within the study area, but the surrounding areas provide essential rail services, such as the C-BR site, which serves the southern and northern lines, and Koeberg, Maitland, Pinelands and Observatory stations.

#### **Issues raised by the I&APs:**

There is a general agreement that the public transport services must be improved to serve the needs of all those in the CMA. There were conflicting views as to whether the study site would be appropriate for the development of public transport services.

#### **Policies and plans:**

At the metropolitan level, government policy encourages rail transport to the city centre, i.e. the IMDF encourages the improvement and upgrading of public transport systems along linear nodes, and areas that already are developed. The C-BR project has plans for a new railway station, just north of the study site, which could influence the study area.

## ***Interpretation***

Rail services are unconditionally fixed in terms of their existing presence, the essential services they provide at the local and regional scale, and the fact that there is the need to improve public services in the CMA. In spite of these reasons, rail services do not directly influence the study area at present, and there are plans to upgrade the existing rail services rather than redevelopment. Developments in the C-BR site and improved rail services in the area could affect the CA in the future.

The *rail services* are considered to be *potential controlling factors* for structural development.

## ***Inventory***

### ***(iii) Bridges***

#### **Description:**

There are four bridges across the Black River. The ACRC and Valkenberg Hospital bridges are used for institutional services, rather than for the public. The rail bridge in the north and the flyover intersections in the south provide essential public services. Widening, translocating or removing the major service bridges would be very expensive. For instance, the plans to widen the Black River would use concrete lining under the bridges as reconstruction would be too expensive. There are plans to build a bridge to link the Malta and Berkley roads, but at great expense.

Issues raised by I&APs:

Bridges were not raised as an issue by the I&APs.

Policies and plans:

Bridges were not identified as an issue.

*Interpretation*

The bridges are unconditionally fixed features in terms of their existence, the essential services they provide and the financial cost of reconstruction, widening or translocating.

The *bridges* in the CA are considered to be *actual controlling factors*.

*Inventory**(vi) Water carrying services:*Description:

The main potable water supply from Observatory is presently running under capacity, thus may be able to supply new developments in the study area. Very large developments, however, will have to find alternative water supplies.

Sewerage services meet the needs of the present users. A few problems have been identified; the manhole in the Valkenberg wetland, picnic site area, overflows during peak times in Winter; the sewerage pipe across the Black River which supplies Maitland Garden Village, is aesthetically unappealing and hinders the flow of the river at maximum capacity.

Stormwater services in the area are not effectively managed. This generates flooding problems in the Liesbeeck Sportsgrounds area. The present services are inadequate for future developments in the area.

Issues raised by the I&APs:

There was general consensus that stormwater and sewage services needed to be upgraded to reduce present flooding and water pollution problems.

Policies and plans:

No specific policies or plans were identified.

*Interpretation*

*Water carrying services* presently provide essential services, but are not considered fixed features. At present they run under capacity or inefficiently, so there is a need for upgrading and improved services.

They are therefore considered to be *potential controlling factors* for structural development, should be reassessed in future project planning in the study area.

### *Inventory*

#### *(v) Other utility services:*

##### Description:

There are a large number of electrical substations on the boundary of the study area. The supply of electricity does not appear to pose serious engineering difficulties. There are two extra high voltage underground cables (66 000 volts and 13.2 mm diameter) on the eastern bank of the Black River. The telephone, gas and refuse removal services serve the present needs of the land-users in the study area.

##### Issues raised by the I&APs:

No issues were raised.

##### Policies and plans:

There were no specific policies or plans identified.

### *Interpretation*

The electrical, telephonic, gas and refuse removal services provide essential services, which are only sufficient to meet the needs of the current users. Future developments will have to reassess their capacities and effects they would have on the area. The electrical cables are relatively fixed in terms of the financial cost and electrical loss to those in Observatory, if they are translocated. They are not however, regarded as a health hazard, but development above the cables could hinder access for maintenance purposes.

These utility services *per se* are not considered to be controlling factors for structural development in the CA. The two *electrical cables* however, are considered to be a *potential hazard* to structural development as they are conditionally fixed in nature.

### **3.3. Summary of the controlling bio-physical and socio-economic factors**

Six environmental parameters are considered to be actual controlling factors for structural development. In other words, they are the factors which are considered to govern the intrinsic capability of the various parts of the study area for the location of structural development. These are described and presented in Table 1.

- *Flooding* is considered to be the *key physical factor*. It is an inherent and potential hazard as the Liesbeeck and Black Rivers flood 2-3 times a year, and affect areas within and above the 1:20yr floodline.

- The *wetlands* are identified as the *key biological factor*, containing a significant range of indigenous reed, grass and sedge in the study site. The wetland areas are important refuge, feeding, gathering and breeding habitats for certain bird populations in the south western Cape. The wetlands are remnants of an extensive wetland area in the CMA, and is continuously being threatened by increasing urbanisation and development. Thus, in terms of the biological significance, and habitat destruction, the wetland areas are vulnerable and scarce resources.
- *Historical and archaeological features* are the *key cultural factors*. They provide society with a sense of culture and place, and are vulnerable resources; once removed future options are lost.
- The present *land-uses* and *landownership* are *key social and structural factors*, and vary in the degree of the fixed status. The present users also have existing rights that cannot be ignored. The manner of public land disposal is a sensitive issue among I&APs.
- The existing *land-controls (zoning and re-zoning)* are the only land-use controls in the study area, so are considered to be *actual controlling factors*. Although the controls are flexible, there are established rules and regulations that must be considered and adhered to in terms of land-use and land-use change.
- The *road networks* are considered to be *actual controlling factors*. The roads (Liesbeeck and Black River Parkways, the N2, and the Malta, Berkley and Alexandra Roads) are considered to be unconditionally fixed; they serve local and metropolitan users or commuters and are too costly to translocate or demolish, so are financial, technical and social constraints on further land-use options in the study area. The bridges are part of the road and rail network and also unconditionally fixed features, given that they are financial and technical constraints to further land-use options. There are also a number of road proposals which are considered to be sensitive issues.

The actual controlling factors are presented in tabular format. The values and summarised reasons for their consideration as a controlling factor have been presented.

Table One

<b>ACTUAL CONTROLLING FACTORS</b>		
<b>Physical parameter</b>	<b>Interpretation</b>	<b>Reasons</b>
Flooding	<ul style="list-style-type: none"> <li>• Inherent and potential hazard</li> <li>• Sensitive issue</li> </ul>	<ul style="list-style-type: none"> <li>• Flooding annually above 5yr floodlevel</li> <li>• Natural phenomenon, intensified by hardened river catchments, canalisation, channelisation and sewage deposits.</li> </ul>
Wetlands	<ul style="list-style-type: none"> <li>• Vulnerable resource</li> </ul>	<ul style="list-style-type: none"> <li>• Biological significance (flora and avifauna)</li> <li>• Regional importance in terms of being some of the few remaining wetlands in the CMA</li> </ul>
Historical and archaeological features	<ul style="list-style-type: none"> <li>• Vulnerable resources</li> <li>• Sensitive issue</li> </ul>	<ul style="list-style-type: none"> <li>• Social and cultural significance</li> </ul>
Land-uses and Landownership	<ul style="list-style-type: none"> <li>• Unconditionally and conditionally fixed features.</li> <li>• Sensitive issue.</li> </ul>	<ul style="list-style-type: none"> <li>• Landowners and users have existing rights that cannot be ignored.</li> <li>• The provision of essential services to society.</li> <li>• Public rights should not be ignored for private gain.</li> </ul>
Land-use controls: the Zoning Scheme.	<ul style="list-style-type: none"> <li>• Legally binding</li> <li>• Sensitive issue</li> </ul>	<ul style="list-style-type: none"> <li>• It is the only land-use control in the study site</li> <li>• Different rules and regulations are established for varying users and land-use changes.</li> </ul>
Roads and Bridges	<ul style="list-style-type: none"> <li>• Unconditionally fixed</li> <li>• Sensitive issues (not the bridges)</li> </ul>	<ul style="list-style-type: none"> <li>• Roads &amp; bridges provide essential services, and are technically and financially fixed.</li> <li>• There is the overarching need to improve the metropolitan traffic services.</li> <li>• Road proposals are sensitive issues that need resolving.</li> </ul>

Seven environmental parameters have been considered to be potential controlling factors. In other words these are the environmental factors which could pose future influences on structural development in the CA. This categorisation may provide future planners or decision-makers with additional information to guide them in specific precinct planning, design or building plans.

- The high wind speeds in the area could affect the construction of high rise buildings.
- The 'infill' area could influence structural development due to its unconsolidated nature.
- Water pollution is a potential hazard for human well-being if 'water-use' options are considered in the future.
- Air pollution is presently controlled by the designated 'Smokeless zone', but could become a potential hazard if industrial uses are considered to be appropriate land-use activities.
- The rail services are not existing influences in the CA at present, but future developments along the surrounding service lines and stations could constrain the type of structural development in the CA, such as development plans in the C-BR site for a new railway station.
- The present water carrying services are presently running under capacity and inefficiently.
- The two electrical cables located on the western banks of the Black River are relatively fixed in terms of their financial cost and electrical loss to those in Observatory.

The potential controlling factors are presented in Table 2. The values and summarised reasons for their consideration as a controlling factor are also provided.

Table 2

POTENTIAL CONTROLLING FACTORS		
Physical Parameter	Interpretation	Reason
Wind factor	<ul style="list-style-type: none"> <li>• Potential hazard</li> </ul>	<ul style="list-style-type: none"> <li>• The high wind speeds could hinder high rise buildings</li> </ul>
Infill land-use (Transnet and SARCC land)	<ul style="list-style-type: none"> <li>• Potential hazard</li> <li>• Sensitive issue</li> </ul>	<ul style="list-style-type: none"> <li>• The unconsolidated nature of the land could hinder structural development in the CA.</li> </ul>
Water pollution	<ul style="list-style-type: none"> <li>• Potential hazard</li> </ul>	<ul style="list-style-type: none"> <li>• 'aquatic developments' will be affected by the existing levels of nutrients and trace metals.</li> </ul>
Air pollution	<ul style="list-style-type: none"> <li>• Potential hazard</li> </ul>	<ul style="list-style-type: none"> <li>• Currently the study site is in the 'Smokeless Zone'</li> <li>• Industrial use activities will have to adhere to the pollution levels</li> </ul>
Rail services	<ul style="list-style-type: none"> <li>• Essential service</li> </ul>	<ul style="list-style-type: none"> <li>• These are essential services in the periphery area.</li> <li>• Developments of the railway services in the surrounding area could influence structural development in the CA.</li> <li>• There is a need for improved public services</li> </ul>
The water carrying services	<ul style="list-style-type: none"> <li>• Inefficient service</li> </ul>	<ul style="list-style-type: none"> <li>• Currently running under capacity</li> <li>• Stormwater, sewage services need better management</li> </ul>
The two electrical underground cables found on the eastern shores of the Black River	<ul style="list-style-type: none"> <li>• Potential hazard</li> </ul>	<ul style="list-style-type: none"> <li>• These could pose serious financial and technical constraints on development, i.e. river widening along the Black River.</li> </ul>

To conclude therefore the actual controlling factors are considered to be flooding, wetlands, historical and archaeological factors, land-use and landownership, land-use controls and road networks and bridges. These factors will be rated in terms of the constraint they impose on development in the CA (see Chap.6, no.3).

Seven potential controlling factors are also identified. These factors will not be analysed further in the land-use assessment. They were merely identified to provide insight for future development planning and design.

The following chapter is a review and preliminary assessment of the regional and metropolitan factors and the social issues which have not been fully considered as part of the assessment of the environmental parameters.

## **CHAPTER FIVE**

# **REVIEW OF THE LAND-USE POLICIES, PLANS & SOCIAL ISSUES**

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### **1. INTRODUCTION**

The broader, non-physical and overarching land-use policies and plans and social issues presented in the baseline report are reviewed and assessed. The social issues which are discussed in this section, pertain to those that have not yet been fully addressed in the former rating of the environmental parameters. The land-use policies and plans are those identified in the baseline report.

The overall objective of this simple assessment is to focus the off-site, abstract factors to present decision-makers and planners with the most significant regional and social issues. This should ensure that future decision-makers consider the land-use policies and plans that presently or potentially influence structural development in the study site. Similarly, this should ensure that the decisions made address the actual concerns of the I&APs.

In reviewing and assessing the land-use policies and plans and the social issues, the overarching criteria of efficiency, equity and sustainability are implicitly employed (see Chap.3, no.2.3). Similarly the problems of bias and decision-making also pertain to these two ratings (see Chap.3, no.5).

The review and assessment is presented in a qualitative format allowing for the interdependence and interactions of the abstract, overarching factors and social perceptions to be presented in a comprehensible format. The land-use policies and plans are initially

reviewed and assessed, followed by the social issues and concerns. Summary sections are also provided.

## **2. LAND-USE POLICIES AND PLANS**

Each land-use policy or plan presented in the baseline document is identified and described in terms of its existing 'controls'. These are then interpreted according to their present or potential influence and control on the inherent capability of the CA for structural development. These are presented as actual and potential factors.

The actual factors are those that are presently controlling land-use planning in the CA. In other words, they are the abstract, overarching factors that are considered to be controlling the inherent use capability of the CA. Similarly, the potential factors are those considered to be factors that will control the inherent use capability of the CA.

### **2.1 Cape Town Metropolitan Areas (CMA) Guide Plan**

#### ***Inventory***

The CMA Guide Plan is a guiding document for future spatial development in the Cape Peninsula. It is based at the metropolitan level and contains broad non-specific guidelines. It is legally binding falling under the Physical Planning Act (No.125 of 1991). It does not infringe on existing rights or create any rights or exempt anybody from their obligation under any other law.

#### ***Interpretation***

The CMA Guide Plan is legally binding and plays an important overarching role in guiding spatial development in the Greater Metropolitan area of Cape Town. For these reasons the CMA Guide Plan is considered to be an *actual* controlling factor.

## 2.2 The Greening of the City Report

### *Inventory*

This report aims to guide management and use of open space in CMA. It was approved by the CCC in 1984 and identifies the natural and sensitive areas for conservation. Its policies are guided by the need for a 'Coast to Coast Greenway', connecting Table Bay to False Bay. Principally, it recognises the ecological and amenity values of areas and calls for a continuous green areas system. It is not legally binding, and the concept has not been implemented due to the lack of funds.

### *Interpretation*

The Greening Report is not legally binding, and its concepts have not been implemented due to financial and administrative constraints. For these reasons, it is considered to be a *potential* controlling factor for guiding and planning a Metropolitan Open Space System (MOSS).

## 2.3 The Interim Metropolitan Development Framework (IMDF)

### *Inventory*

The IMDF is a discussion document which has not yet been approved by the Western Cape Economic Development Forum (WCEDF). It focuses on the need for change in patterns of urban development in CMA. It advocates the need to contain urban sprawl, intensify development in the existing urban areas and the creation of quality urban environments. Key development areas are considered to be along 'activity corridors', with green areas controlling urban sprawl. These green areas should have multiple uses, such as providing amenity areas, conservation areas and providing adequate stormwater drainage.

### *Interpretation*

The IMDF is not legally binding, but it is presently guiding the restructuring process and policy making in the CMA. For these reasons the IMDF is considered to be an *actual* controlling factor.

## **2.4 The Western Cape Economic Development Forum (WCEDF) Proposed Guidelines for the Release of Public Land**

### ***Inventory***

These are guidelines drawn up by the Urban Development Commission. Its central vision is that the development of public land could have a marked positive impact of current inequitable structure and functioning of the CMA, such as providing affordable housing, recreational facilities, open space and the creation of job and educational facilities. It highlights the need for more participatory planning, and advocates a 'package of plan' approach to future land-use development. The CA is largely public land.

### ***Interpretation***

These guidelines are currently not legally binding. Their positive approach to planning could however, play an important role in land-use planning on public land. By advocating the need for a participatory role it is attempting to address the needs of society. This becomes an important issue if land viewed as public land is developed or sold for private purposes in the CA. These guidelines are considered to be *potential* controlling factors.

## **2.5 Culemborg-Black River (C-BR) Contextual Framework**

### ***Inventory***

The C-BR Contextual Framework is part of the five year development planning study for the C-BR site, situated just to the northwest of the study site. This framework study is being undertaken by the CCC, and encompasses city and district-wide considerations. It is the overarching study for the C-BR site. The development framework studies currently being undertaken by Transnet and SARCC, are more specific (Aberman, 1994a). These studies are the initial studies in the 'package of plans' approach, which has been adopted. This approach has adopted a principle of public participation. Its interim findings are therefore important, setting out goals for open space, high density housing and mixed land-uses. It recommends that impact assessments should be undertaken before major land-use changes are implemented.

### ***Interpretation***

The C-BR study is the only site specific plan, currently being undertaken, and its final findings will influence the land-use options of the CA. It is considered to be an *actual* controlling factor.

## **2.6 The Planning Initiatives in the Peripheral Areas**

### ***Inventory***

All the plans (except Pinelands Vision) are approved under Land Use Planning Ordinance (LUPO) (15 of 1985), but are not legally binding. They only guide decisions on land-use in the areas. The guidelines call for the protection of residential areas from developments of non-residential activities; the protection of historically significant buildings and surroundings; the need for improved open space areas and community facilities and the need to improve commercial and business opportunities in CMA.

### ***Interpretation***

The guidelines are not specific to the study site but establish land-use controls at the peripheral/regional level, which indirectly influence the study site. They are considered to be *potential* controlling factors

## **2.7 Summary of the assessment of the land-use policies and plans**

The land-use policies and plan described above are all important in a general overarching or peripheral manner, some are more significant in governing the inherent use capability of the CA. Presently, the most influential overarching policy is the CMA Guide Plan, which is legally binding under the terms of the Physical Planning Act 1964. It does not however, provide site specific land-use controls. The C-BR study is the most important at the site specific level. It is presently part of the five year study of the C-BR area, currently being undertaken by CCC, Transnet and SARCC. The IMDF focuses on the need for change in the urban development in the CMA, and is specifically important in that it is guiding metropolitan planning in Cape Town.

The WCEDF Proposed Guidelines for the Release of Public Land, are potentially important for the study site, as a large proportion of the CA is public land. The Planning Initiatives in the peripheral areas are important as they are regional guidelines which could potentially influence future development in the study site.

### **3. SOCIAL ISSUES**

This section aims to reconsider and assess the social issues identified by the I&APs, and documented in the baseline report, which have not yet been fully addressed. These issues are mainly reviewed, and those which are considered to be most significant in terms their overarching national and metropolitan perspective are considered to be the key social issues. Those issues that are considered to be most significant at the site-specific level are defined as the key site-specific factors. The assigned 'significance' is determined by the author, founded on personal involvement in the baseline document, and a certain amount of 'gut feeling'.

This is not strictly an assessment, but it is a guide and focuses the social issues. This may aid the decision-makers and the planner in future land-use planning in the area, to ensure that the key regional and site specific factors are considered.

#### **3.1 Planning**

The I&APs identified the need for more effective planning for Cape Town, and that this should be more comprehensive in the CMA region. There was consensus that the present planning approach should be improved, and a number of suggestions were made as to how this should be undertaken: There should be better communication between the planning departments; good conceptual plans should be implemented; planning should be flexible and proactive and should account for the needs of the people. I&APs also identified the need for effective planning in the CA and looked at the local and regional needs. Furthermore, some identified the study area as a planning opportunity for the CMA.

### **3.2 Development**

The need and opportunity of development in the CA is debated, but there is general consensus amongst the I&APs that development in the CA should strike a balance between development and other environmental needs, and that future piecemeal development should be restricted. In addition, there was a call for a comprehensive development plan for the CA, prior to further development.

### **3.3 Public Participation**

There was general agreement that public participation was essential in determining land-use options in the CA. The needs of the people should be determined in consultation with the I&APs, and reviewed prior to and after implementation.

### **3.4 Disposal of public land**

There were conflicting opinions about whether public land in the CA should be privatised. This has been enhanced by the current studies being undertaken in the C-BR site by the CCC, Transnet and the SARCC. Some believed that Transnet land belonged to the people; others believed that privatisation would allow for good planning. There was consensus however, that the current methods of public land disposal was problematic.

### **3.5 Development proposals**

A number of different proposals were identified by the I&APs and specialists in the baseline report. There was general agreement that the manner in which each one influences or will influence the study area, should be investigated before it is approved and implemented. It was suggested that IEM procedures could be adopted.

### **3.6 River Management**

There was general consensus that the current management of the rivers is inadequate in the CA, and that there was a need to upgrade the catchment management schemes for the Black and Liesbeeck Rivers. There were conflicting views about whether the river widening proposals, or channelisation or cannelisation should be employed for flooding control in the CA.

### **3.7 Open space**

I&APs identified the need for improved and managed open space systems in the CMA. There are conflicting views about the appropriateness of open space as a future land-use in the study area, and whether the area should be included in a greater MOSS. The financial viability of managing open space is questioned, yet simultaneously there is concern of the loss of future options if the present open spaces in the CA are lost.

### **3.8 Conservation of the natural environment**

There was general agreement that the natural environment must be conserved, but there were conflicting views about the conservation worthiness of the CA. In addition, it was recognised that funding for conservation could be a problem.

### **3.9 Recreation**

There was general consensus that recreational facilities are urgently needed in the CMA. These services should be made more available and efficient. The appropriateness of the CA was however questioned in terms of the number of peripheral sporting and recreational areas, i.e. Hartleyvale, and the inefficiency of the existing recreational services.

### **3.10 Housing and education**

In recognising that there was an overarching need for housing and education in the CMA, there were conflicting views about the appropriateness of the CA for the provision of these

services; especially housing, as it appeared to be in direct conflict with environmental concerns. Formal education could blend in with the institutional characteristic of the area. Also, a number of informal educational facilities were considered.

### **3.11 Job creation**

Unemployment rates are rising in Cape Town, and the I&APs identified the local, metropolitan and national need for creating job opportunities. There were however, conflicting opinions about the employment opportunities in the study site.

### **3.12 Squatting and illegal land occupation**

There were conflicting opinions about whether the CA was threatened by illegal land occupation. It was not perceived to be a serious concern.

### **3.13 Security**

There were conflicting views about the level of security in the CA. It was not perceived to be a serious concern.

## **4. INTERPRETATION OF THE SOCIAL ISSUES**

The short descriptions on the issues raised by the I&APs highlights the overarching metropolitan needs, opportunities, and conflicting societal values.

### **4.1 The key social issues**

The key social issues are those that are considered to be of metropolitan significance, i.e. generic social issues. In essence, there is a general consensus at regional level identifying these social concerns as 'needs'.

The key social issues are considered to be:

- The need for improved metropolitan planning
- The need for public participation
- The need for conservation
- The need for open space development and recreation
- The need for housing, job creation, education facilities.

All the above factors are considered to be metropolitan needs and are currently substantiated in the present national constitution. A democratic, efficient and equitable approach to planning is regarded to be critical for good land-use planning.

Similarly, these issues are presently influencing, and will continue to influence the CA. These needs, inherent in conflict, and are the social demands that land-use planners and decision-makers must address. For instance, at the site specific level, there were conflicting concerns about the appropriateness of the CA for housing, education, job creation, conservation, recreation and open space development.

In addition there was general consensus about the need for good metropolitan planning at the regional and site specific level. Similarly, there was a demand for public participation at the metropolitan and site specific level.

## **4.2 The site specific issues**

These are the issues that are considered to be important at the site specific level and of less importance at the regional level.

These were considered to be:

- The need for a comprehensive plan for the CA: There was general consensus amongst the I&APs that development in the CA should strike a balance between development and other needs, and that future piecemeal planning should be avoided.

- River Management: There is general consensus that river management for the Liesbeeck and Black Rivers should be improved, but conflict about the methods used for river widening. River management is a both site specific and regional, given that the river systems are linear ecological systems, influenced by anthropogenic factors throughout its catchment area. Being a confluence area of the Black and Liesbeeck Rivers, the magnitude and complexity of managing the rivers is worsened. This issue is probably going to be intensified, with increasing urbanisation in the catchment areas.

It could potentially become the major issue in the CA, given that there are continuous pressures to widen the Black River in order to control the flooding problem. Both the hard engineering techniques such as channelisation should be considered. Similarly, the soft techniques, such as the wetland retention, should also be reconsidered.

- The development proposals: There are a number of development proposals, each of which could affect the study site in a number of different ways. These range from river widening, to widening of the Liesbeeck Parkway to the development of the proposed Malta Berkley Road Link. Each development will have its own impact on the area. Prior to implementation, environmental impact assessments should be undertaken.
- Disposal of public land: The conflict between private and public land-use rights is an old issue in land-use planning. Imaginative land-use controls are required in the study. Similarly, the private landowners such as Transnet, must become more cognisant of public needs.

Two issues were considered **not** to be of significance at the regional or site specific level. Security and squatting and illegal land occupation are identified as minor issues.

From the above assessment, the main social issue encompassing the metropolitan and site-specific is the need to provide a development plan for the study site that involves public participation. This should resolve:

- the conflicting needs of conservation, recreation and open space development, housing, education and job creation and
- the conflicting site specific demands being made on the area, i.e. different forms of river management, the number of different development proposals and the question of public land disposal.

The following chapters use the actual controlling factors defined in Chap.4, no.3 to determine the areas of most to least constraint for development.

## CHAPTER SIX

# THE ASSESSMENT

---

### 1. INTRODUCTION

The actual controlling factors (hereafter referred to as the controlling factors) are rated in terms of the constraint they impose on development in the study area. For each controlling factor levels of constraint are determined. These are defined by a range of values. Constraints maps are then provided presenting the range of values of each controlling factor.

To begin with the controlling factors are identified, and then the rating system and the range of values employed in the assessment, are described. This is followed by a brief outline and discussion about the manner in which the assessment is presented. The controlling factors are then assessed.

#### 1.2 The controlling factors

The controlling factors are those identified in Chap.4, no.3. These are the environmental parameters which are governing the intrinsic capacity of the CA for the location of structural development. Those identified are: flooding, wetlands, historical and archaeological factors, existing land-uses and landownership, land-use controls and the road networks and bridges. These factors, with the exception of the road networks and the bridges, are assessed in order to identify the limitations to, and opportunities for varying land units in the CA.

It proved to be ineffectual and inefficient to rate the roads and bridges. It is assumed that they are fixed features, i.e. the Black River Parkway transects the area, the technical skills required and the expenditure involved would jeopardise its relocation. To overcome the problem of rating, these two controlling factors are presented on the base maps.

The road proposals such as the proposed Malta/Berkley Road link, are a cause of concern for the I&APs. Being potential issues, these factors have not been classified as an actual controlling factor. These issues are addressed as development proposals and outlined in the social issues in Chap.5, no.3.5.

## **2. METHODS, PROBLEMS & PRESENTATION**

### **2.1 The rating system**

The controlling factors are rated according to their inherent capability to support structural development, and are described in terms of the constraint each factor imposes on development.

This is a categorisation process adapted from the overlay approach institutionalised by Ian McHarg (1969) in land suitability studies. These categories were used to help focus the assessment, by seeking maximum social benefit and least social cost.

Three categories are used to describe the level of constraint each controlling factor poses on structural development. These are defined as:

- Major constraints: refer to the situation where the controlling factor is considered to pose greatest constraints on development in terms of being least resilient, most sensitive or most unsuitable to structural development. The technical, social and economic cost of ameliorating, alleviating or avoiding these constraints are too great or may result in the loss of future options.
- Medium constraints: refer to the situation where the controlling factor is considered to be moderately resilient, moderately sensitive and/or moderately unsuitable for structural development. The cost of alleviating, ameliorating or avoiding these constraints could effect the viability of structural development and incur the loss of a few future options.

- **Minor constraints:** refer to the situation where it is considered that the controlling factor is resilient, not sensitive and suitable for development. The cost of alleviating or overcoming the constraints that do arise will be minimal, and development in the area could have beneficial effects.

The 'no constraint' category was not employed. The reason for this is that the study aims to identify the limitations to development, in order to determine the inherent capabilities and opportunities for a more suitable land-use, i.e. the reductionist process.

## 2.2 The range of values

For each controlling factor the selected categories of constraints are defined by a range of values. The selected range of values depends on the controlling factors inherent, natural or intrinsic ability to support development, and includes that existing ability which is the result of past alterations or current management practices. These varying ranges of value may be altered and an amended rating obtained, given different or more defined land-use alternatives.

The worth, quality, significance, amount, degree or condition of each individual factor to determine the limitations to, and opportunities for development, are examined and judged. Two sets of criteria are employed in assessing the range of values for each controlling factor. The over-arching criteria defined in Chap.3, no.2.3 are implicit throughout the assessment; these being efficiency, equity and sustainability. Individual standards of value (criteria) are also provided for each controlling factor. For example, flood prone areas are most unsuitable for development, whereas the areas located above a designated floodplain are more suitable for development.

Professional judgement was employed to determine the range of values and the ratings, i.e. constraints for each controlling factor. Personal experience, site visits, personal involvement in producing the baseline report, literature surveys and some specialist advice provided the basis for such value judgement.

The assessment aims to be objective, but subjectivity was unavoidable being an inherent problem in any value judgements (see Chap.3, no.5).

### **2.3 The problems**

The constraints maps are used to present the data in a spatial format. There are some recognised limitations of this technique in presenting information. These are identified in Chap.3, no.3.1. To overcome some of the limitations, certain measures have been adopted in the mapping technique used in the study. These are described.

- The criteria used for valuing each controlling factor and the value judgements made have been described openly and explicitly in order to avoid hiding the ranking and weighting systems.
- The zoning map and discussion of the controlling factor aims to bring an element of meaning to the abstract features and second or third order interactions. This gives contextual meaning to the assessment of the controlling factors. These are often ignored in overlay and environmental mapping.

In light of these attempts to mitigate negative influences of the mapping technique, it is accepted that limitations are unavoidable given the wide spatial, local and regional parameters influencing the study site. The constraints maps do however, provide spatial meaning to the range of values identified for each controlling factor. The maps presented here are overlain to produce the final composite constraints map presented in Chap.7, no.2.

### **2.4 The presentation**

There are three forms of presenting the data; the text, the constraints map and the table. These are described respectively.

The text format:

- an introductory section briefly outlines the reasons why the controlling factor is determined
- a discussion section examines the controlling factor in more detail, highlighting the relevance of the factor to the study area, and providing a general description of the factor.
- The methodology defines the criteria adapted for each factor. As this is different for every factor, no systematic format has been adopted.
- The controlling factors are then rated according to their inherent ability of the physical factor to provide for development, and described in terms of the level of constraint they impose on development.

The constraints maps:

Capability constraints maps are presented for each controlling factor. These are produced on a base map of 1:10 000. The base map is adapted from a 1:2000 blackline map produced by Larry Aberman town planning coordinating consultant, November 1993. This was produced on a Geographical Information System (GIS) presenting the cadastral boundaries, the roads, the railway lines and the existing structural features, and the natural features, such as the rivers. Different textures and styles of black and white shading presents the information. These are defined in the separate keys.

The table:

The range of values for each controlling factor and the level of constraint are described in tabular format. This is comprehensive and should be used as a reference. The table is presented in the summary.

### **3. THE ASSESSMENT**

Flooding is initially reviewed and assessed, followed by wetlands, historical and archaeological factors, land-use and land-ownership and lastly land-use controls; zoning and rezoning. A table of all the factors, their range of values and level of constraint, is then provided.

It is important that the capabilities constraint map for each controlling factor is referred to whilst reading the assessment.

### **3.1 Flooding**

Flooding is identified as an actual controlling factor, being a natural and potential hazard to human life and property in the CA. Flooding of the Liesbeeck and Black Rivers is an annual occurrence, mainly affecting the Liesbeeck Sportsgrounds. I&APs also identified the need for improved river management, and reconsideration of the flood levels and flood control methods. It is also a natural phenomenon which is fundamental to the continuation of the wetland habitats. It can thus be classified as a vulnerable resource for the natural habitat.

#### **3.1.1 Discussion**

Floods, from an ecological point of view, are part of the natural river process. From an anthropocentric stance, floods cause damage to human property or well-being by overflowing the river banks, or exceeding a threshold value. Development in any floodplain is vulnerable to flooding, so should either be avoided or controlled. Floodlines have thus been used on maps and drawings. They are determined when the water level reaches a constant discharge equal to the estimated peak flow, having a specified annual exceedence probability of e.g. 1:20; 1:50 or 1:100yrs (Alexander, 1993). The designated floodline, determined by a local authority, is widely used throughout the world to control development in flood prone areas, whereby limitations are placed on development below the floodline, while no restrictions are placed above the floodline.

In South Africa there are few safeguards against the approval of inappropriate activities within the floodlines, and even fewer to the river flow characteristics (Sowman and Wiseman, 1991).

For instance, statutory provisions pertaining to floodlines are questionable. In terms of LUPO (15 of 1985), developments in flood prone areas are refused on the basis of desirability of the contemplated land-use. There is generally a lack of understanding about the river systems. For

instance, little consideration is given to the potential consequences of increasing development on river hydrology, below the 1:50yr floodline, or on the floodplains (Sowman and Wiseman, 1991). In other words, the legal system and the administrative framework do not recognise that freshwater systems are dynamic ecosystems (Sowman and Wiseman, 1991).

### 3.1.2 Methodology

The objective of rating the floodlines in the CA is to determine the areas which impose greatest constraint on development, i.e. flood prone areas.

The information presented in the baseline document, provided the initial flooding data. The floodlines (i.e. 1:5, 1:20 and 1:50yr) were used as the basis of the analysis. The standards of value were determined by reviewing:

- the views of the I&APs;
- the past flooding experiences;
- the legal and administrative status of the flood prone areas in the CMA;
- the international standards of developing in flood prone areas and
- the ecological benefits of flooding.

### 3.1.3 The ratings and the constraint map (see Map 3)

One level of constraint has been determined for flooding.

The major constraint zone: The areas located below the 1:50yr floodline are defined as major constraint areas, being inherently unsuitable for development, and natural and potential hazards to human well-being. This refers to the areas found along the Liesbeeck and Black Rivers below the 4.5 metres amsl and 4.6 metres amsl respectively, and includes land-uses such as the Liesbeeck Sportsgrounds, RBS and SAAO buildings bordering the RBS.

This area has been defined as such for a number of reasons:

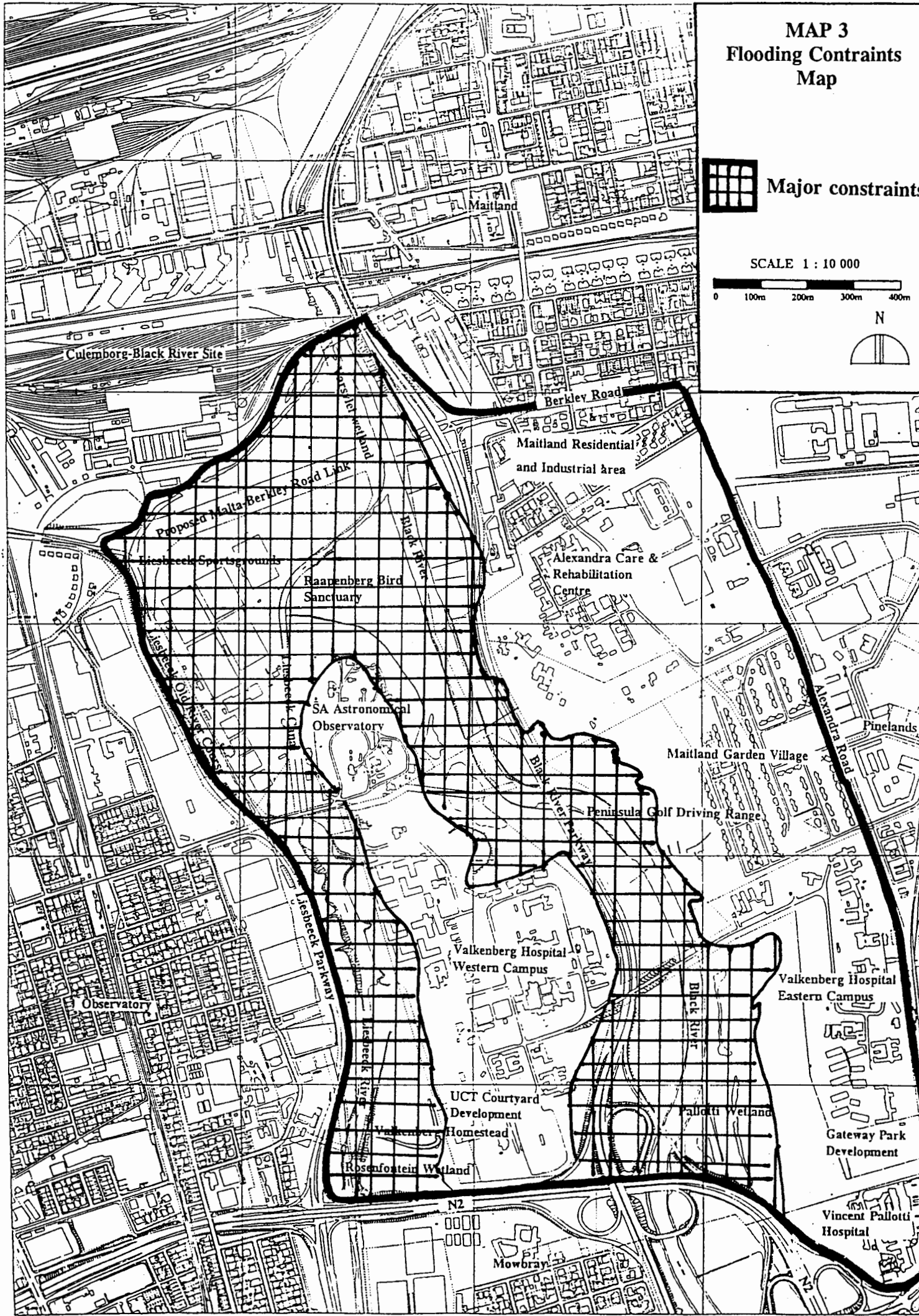
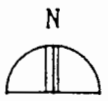
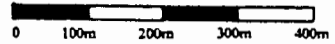
- The I&APs questioned the accuracy of the present floodlines, claiming that the annual floods occur in the CA within and up to the 1:20yrs floodline, sometimes affecting the

# MAP 3 Flooding Constraints Map



Major constraints

SCALE 1 : 10 000



Culemborg-Black River Site

Maitland

Berkley Road

Maitland Residential  
and Industrial Area

Proposed Malta-Berkley Road Link

Biscuits Sports Grounds

Raapenberg Bird  
Sanctuary

Alexandra Care &  
Rehabilitation  
Centre

SA Astronomical  
Observatory

Maitland Garden Village

Peninsula Golf Driving Range

Observatory

Valkenberg Hospital  
Western Campus

Valkenberg Hospital  
Eastern Campus

UCT Courtyard  
Development

Pallotti Wetland

Gateway Park  
Development

Rosenfontein Wetland

Vincent Pallotti  
Hospital

Mowbray

areas above the 1:20yr floodline. Photographic evidence provided in Appendix 1 shows that the levels are higher than the 1:5yr floodline. This could be a result of the increasing hardening of the catchment areas, and a lack of understanding of the natural river systems.

- Flooding in the area is an inherent characteristic. Prior to intensified urbanisation in the catchment areas and before the Varsvlei, Liesbeeck Sportsgrounds were infilled, the area was a wetland and used to flood annually (Tilanus, pers. comm. 1994). See Appendix 2 for factual evidence.
- The 1:50yr floodline has been formally recognised for land-use planning in the CMA. In terms of LUPO 15 of 1985, rezoning applications below the 1:50yr floodlines, unless approved in a structure plan, are excluded (Wiseman and Sowman, 1991). Also, the Council for the Environment advises that developments in areas below the 1:50yr floodline be restricted.
- International standards such as in the USA, prohibit or strictly restrict development below the 1:50yr flood level (Leopold, 1974).
- Flooding is natural to the river ecosystems. This is a stochastic event that cleanses the ecosystems. It is also a fundamental resource for the wetland habitats.

The areas above the 1:50yr floodline were considered **not** to be a constraint. These areas are not inherently flood prone areas, characterised by higher ground, i.e. above the 4.5 meter or 4.6 meter contour line.

### **3.2 Wetlands**

The 30 ha of existing wetlands situated in the CA were identified as areas of biological and conservation significance. They are a vulnerable and scarce resource, given the increasing pressures for development in the CMA, where unregulated development and utilisation of the wetlands will result in social cost and loss of the resource. The wetlands also represent areas in the study site which are inherent flooding areas, causing inherent hazards to human life and property in the flood prone areas. Given the above reasons, the wetland areas were determined as actual controlling factors for land-use options.

### **3.2.1 Discussion**

Defining wetlands is inherently problematic owing to the fluctuating soil, water, flora and fauna characteristics (Morant, 1981). Simply described, wetlands are what the term implies - 'wet lands'. Questions however, arise in the more specified application of the term to lands that are flooded infrequently and those that are subject to deep and littoral flooding. The U.S Fish and Wildlife Service have developed a national wetland classification system determined by the plant types and soil characteristics. The important factors are the actual physical features of the wetland from a management view.

Natural wetlands have a number of ecological and social functions which include habitat for avifauna and wildlife, habitat for rare and endangered species, flood conveyance and storage, sediment and pollution control as well as recreational, aesthetical, educational and historical value. There are also a number of hazards associated with activities in wetland areas such as flood hazards or flood potential and erosion.

Wetlands are of significance as they are nationally and globally threatened resources. Development pressures and the lack of understanding has resulted in wetland degradation. The wetland areas in the CA, as defined in the baseline report, are a good example of a natural wetland modified and threatened by increasing development. The natural characteristics have not been properly understood, which has resulted in habitat degradation and flooding hazards.

### **3.2.2 Methodology**

The objective of rating the wetlands in the CA is to determine the constraints they impose on development in the CA, i.e. the least resilient or most sensitive areas.

In order to do this, broadly defined wetland criteria were determined:

- the ecological benefits and losses;
- the social benefits and losses and
- the local or regional significance of the wetlands.

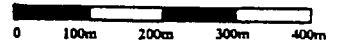
**MAP 4**  
**Wetlands Constraints**  
**Map**



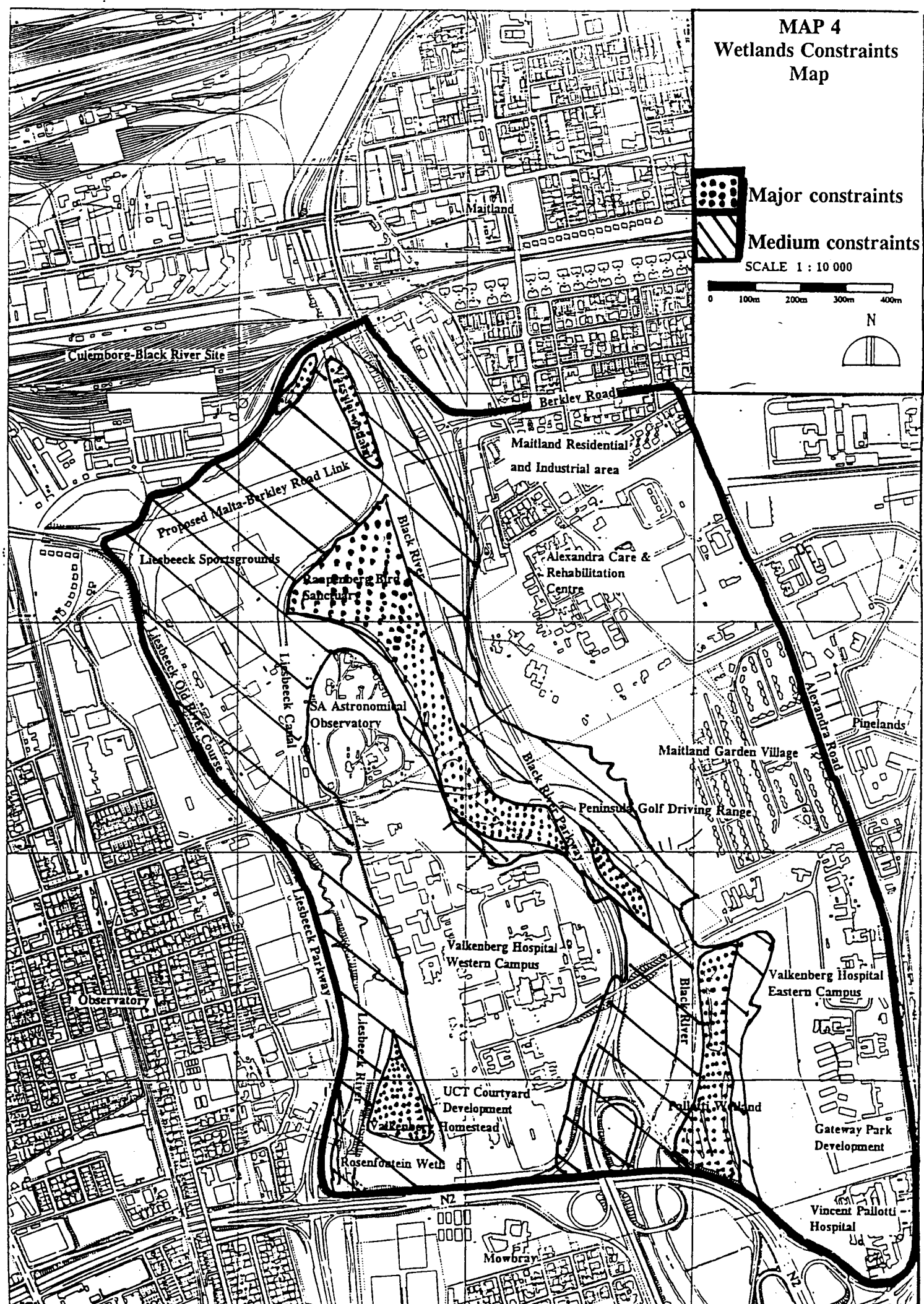
Major constraints

Medium constraints

SCALE 1 : 10 000



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Culemborg-Black River Site

Maitland

Berkley Road

Maitland Residential  
and Industrial area

Proposed Malta-Berkley Road Link

Liesbeeck Sportsgrounds

Raanperberg Bird  
Sanctuary

SA Astronomical  
Observatory

Alexandra Care &  
Rehabilitation  
Centre

Maitland Garden Village

Peninsula Golf Driving Range

Pinelands

Valkenberg Hospital  
Western Campus

Valkenberg Hospital  
Eastern Campus

UCT Courtyard  
Development

Rosenfontein Wetland

Gateway Park  
Development

Vincent Pallotti  
Hospital

Mowbray

### 3.2.3 The ratings and constraints map (see Map 4)

Two levels of constraints are defined for wetland areas in the CA. These are described:

The major constraint areas: The main wetland areas, i.e. the Raapenberg wetland, the Rosenfontein wetland, the Varsvlei wetland and the Rosenfontein wetland.

The reasons for this classification are:

- The wetland areas are naturally inundated throughout the year, and influence flooding hazards in the CA.
- They are of biological significance and conservation worthy, i.e. Raapenberg North site has the highest proportion of indigenous species and habitat types. They are also of regional significance, i.e. important refuge, feeding and gathering areas for migrating birds and are remnants of existing wetland area in the CMA.
- The Raapenberg wetland is presently a sanctuary. This provision is however, weak in terms of statutory protection (Turpie, 1994).

The medium constraint areas: These are the areas situated below the 1:20yr floodline. These areas are naturally hazardous, flood prone areas, influenced by the inherent flooding nature of the wetlands. Additionally, most of these areas are remnants of the localised wetland but have been modified or infilled. Furthermore, they provide a refuge for the birdlife along the watercourses.

The areas found above the 1:20yr floodline are considered not to be influenced by the ecological characteristics of the wetlands, i.e. structural development is not directly influenced by the soil, water, flora or fauna characteristics of the wetlands.

### 3.3 Historical and archaeological factors

The historical and archaeological features and past developments in the area were considered to be controlling factors. They are valued by society, i.e. the I&APs and the majority of the policies and plans called for the conservation of historically and archaeologically significant

aspects (MPhil class, 1994). These are culturally significant, sensitive and vulnerable resources, which are of conservation worthiness. Given the above reasons, the historical factors were considered to be actual controlling factors.

### **3.3.1 Discussion**

Historical and archaeological features pertain to the cultural and historical aspects of any environment. Their significance is determined by the society in which they are located, and varies according to the societal values.

Traditionally the conservation of cultural environments has been undervalued. For instance, the Convention Concerning the Protection of the World's Cultural and Natural Heritage adopted by the General Conference of UNESCO in 1972, is the only international convention which seeks to conserve areas of 'outstanding universal value'. Similarly, in South Africa, the National Monuments Council, which provides for the preservation of certain property, both immovable and movable, as national monuments, is subject to the jurisdiction of National Education, which underscores its value (Hanks and Glavovic, 1992). Ideally, buildings of historical importance should provide a 'sense of culture' and history, thus sites and features of significance should be viewed in their context.

The CA has a long development history which is significant in the history of South Africa, as it forms the first meeting place of the Settlers and the local inhabitants, where landownership became contentious (MPhil class, 1994). The relics of the natural environment are also important, providing a richness of character. These have not been properly understood or conserved, which has resulted in degradation of the cultural and natural heritage. Furthermore, few investigation into archaeological or other historical remains have been made, and the role that the CA can play as a place of natural, religious and historical interest has not been adequately cultivated (MPhil class, 1994).

**MAP 5**  
**Historical and**  
**Archaeological**  
**Constraints Map**

Major constraints

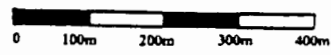


Medium constraint



Minor constraints

SCALE 1 : 10 000



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### 3.3.2 Methodology

The aim of this section is to determine the various levels of conservation worthiness of the varying historical and archaeological factors represent, i.e. their range of values and the level of constraints.

The criteria used for the rating referred to:

- the recognised conservation worthiness of the features, i.e. by the I&APs and the CMA Guide Plan (MPhil class, 1994);
- the cultural benefits and losses of the identified features, and
- the local and the regional significance of the features.

### 3.3.3 The ratings and the constraints map (see Map 5)

The major constraints: These are considered to be the historical and archaeological features of specific cultural importance, and those declared as National Monuments. Technically, socially and economically they pose limitations to structural development. More specifically these are:

- the Valkenberg Homestead declared a National Monument in 1986, and is currently under renovation as part of the UCT Courtyard development;
- the Valkenberg Hospital main administration building declared a National Monument in 1991, and is still used by the hospital;
- the Nieuwe Molen located in the ACRC premises, declared National Monument in 1978, currently undergoing a R600 000 revamp, and
- the main SAAO building which serves scientific and research purposes.

The medium constraints:

These are considered to be:

- The historical precincts; these provide a 'sense of place';
- The buildings older than 50yrs which have conservation potential. Permission from the NMC is required for alterations or removal of these buildings.
- The archaeological precincts; these are potential assets to society.

The minor constraints:

Only one minor constraint has been considered this is:

- Maitland Garden Village which was built in the 1920s has maintained an individual character.

### **3.4 Land-use and Landownership**

Land-use and landownership were considered to be controlling factors, on account of their existence and present land-use rights. In addition, the disposal of public land has become a sensitive issue, given that Transnet was part of South African Transport (SATs), and became a private company in 1991.

#### **3.4.1 Discussion**

The study area is characterised by institutional uses; Valkenberg Hospital for primary health care and mentally handicapped patients, serves the local and regional community; Alexandra Care and Rehabilitation Hospital (ACRC) for congenital retarded and brain damaged patients; Vincent Pallotti a private hospital and the SAAO which is used for research and information processing.

The other major land-uses are the Liesbeeck Sportsgrounds owned by Transnet and the SARCC, currently being leased and upgraded by the River Club; RBS along the western shores of the Black River and the Valkenberg Homestead and environs which are currently being developed by UCT Courtyard development.

These service orientated land-uses have maintained an open-space ambience, enhanced by the natural environment of the Black and Liesbeeck Confluence area. The area is one of the few open space areas located close to the CBD of Cape Town.

The conflict between structural development and green open space is inherent in most urbanised areas in the western world. Continuous demands are made on areas that are regarded as undeveloped and strategically located for urbanisation. There is thus continually a need to find imaginative measures to overcome the areas of conflict, i.e. to derive creative land-uses which complement both 'needs'.

There are also conflicting opinions, internationally and in the CA, over the public and private land-use rights. The Transnet and SARCC development frameworks currently being formulated, have enhanced the conflicting opinions about whether their land should be developed for public or private purposes.

### 3.4.2 Methodology

The objective is to determine the inherent capacity of the current land-uses to support further development. Land-uses and landowners are inherently unstable and fluctuate according to the perceptions, needs, goals and objectives of society. The ratings provided in this section are based on the assumption that certain land-uses are more fixed in terms of their structural presence and provision of services than others.

The criteria employed for this assessment referred to:

- the provisions of services provided by the existing land-use;
- the technical and economical status of the existing land-use in terms of the translocation or removal costs and,
- the legal status of the land-use.

These have been defined in terms of the fixed or non-fixed status of the land-use, and are described as:

- Unconditionally fixed: This pertains to the land-uses considered to be of special interest, essentially irreplaceable, in limited supply, of local or national importance or provide special or essential services. They are also technically and economically 'fixed'. The cost of relocation or of removal would entail considerable expenditure.

- **Conditionally fixed:** This pertains to the land-uses considered to provide needed, not essential or special, services or goods at the local and national scale are referred to as medium constraints. Technically, socially and economically they are conditionally fixed as would pose a certain amount of difficulties in being moved or removed.
- **Non-fixed:** This pertains to the land-uses which are of no special interest, provide no essentially irreplaceable, unique service at the local or regional context. Technical, social and economical factors are not fixed. Land-use change may have beneficial effects.




### 3.4.3 The ratings and constraints map (see Map 6)

The land units, as defined in the baseline report, have been individually rated. These are described.

**The major constraints:** These are the land-uses considered to be unconditionally fixed.

- *Valkenberg Hospital western campus* (VHWC) provides essential services. These are primary health care, forensic, psycho-geriatric and neurological services for the local and regional community of the CMA. Its technological and research services are recognised as one of the best in South Africa (Dare, pers. comm., 1994). It provides educational services which are closely associated with UCT medical department. The hospital has close links with Groote Schuur Hospital, being dependent on staff, technology and equipment from the hospital. Lenteghuur Hospital, in the Cape Flats is the only other hospital for the mentally handicapped in the CMA, mainly providing services for the local community in the Cape Flats. The campus is and has been undergoing renovation and upgrading.
- The *Alexandra Care & Rehabilitation Centre* provides unique and essential services to congenitally retarded and brain damaged patients, mainly serving the regional needs of the CMA. It is the only Hospital in the CMA which provides this service. It is also currently undergoing extensive modernisation.
- *Vincent Pallotti Hospital* is a private hospital providing essential health services to the local and regional community of the CMA.
- *The South African Astronomical Observatory* (SAAO) is the oldest scientific institution in South Africa, founded in 1820. Presently the 'observatory' *per se* is obsolete, but the

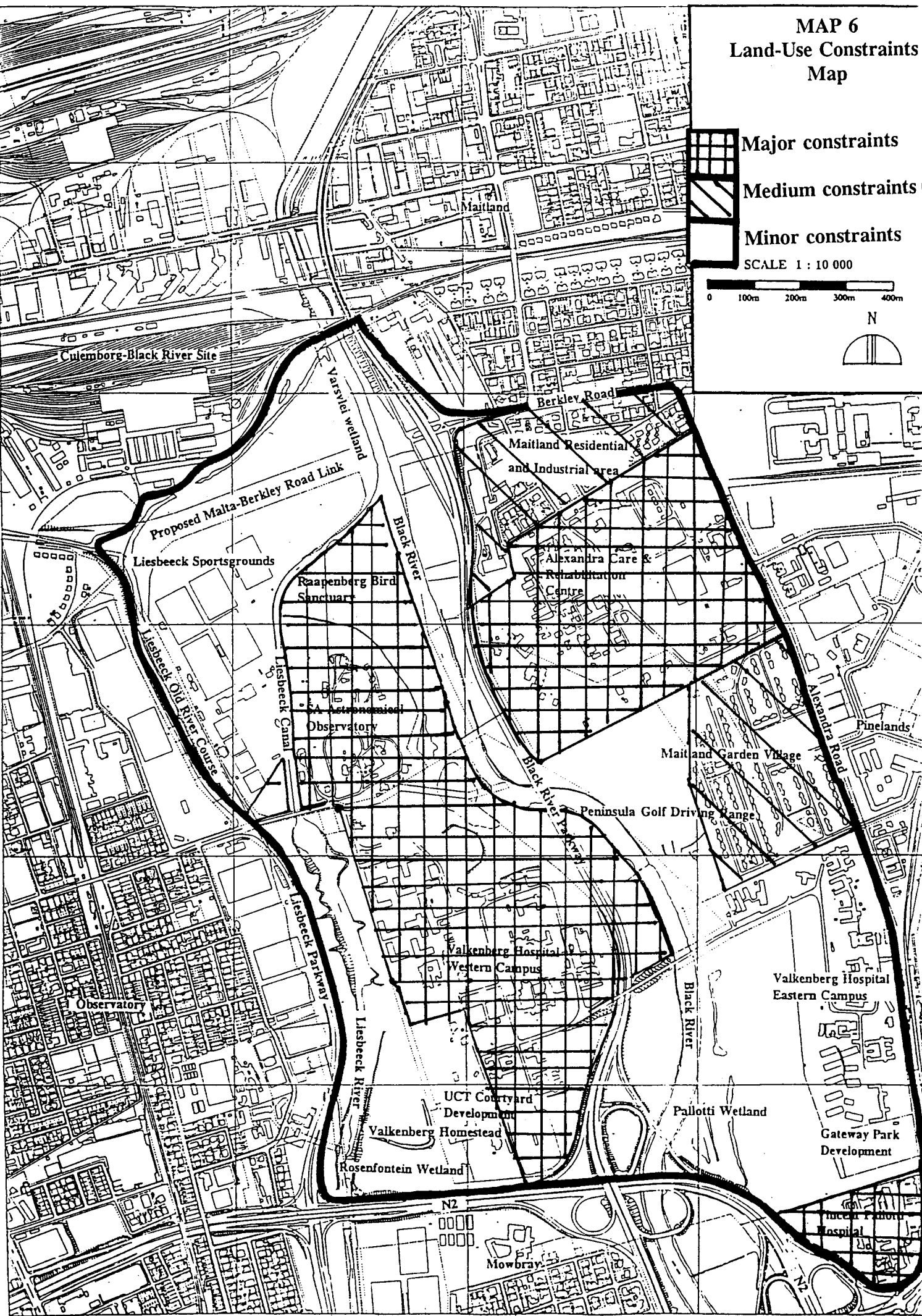
# MAP 6 Land-Use Constraints Map

-  Major constraints
-  Medium constraints
-  Minor constraints

SCALE 1 : 10 000



N



institution is used for research and image processing for the observing stations in Sutherland.

- *Raapenberg Bird Sanctuary* (RBS) is the only bird sanctuary close to the CBD of Cape Town, providing protection to the avifauna and wetlands habitat. Its status as a sanctuary entails that the area's conservation worthiness has been recognised by the local authorities. It does provide a unique service to the local community, though access is currently limited.

The medium constraints: These are the land-uses considered to be conditionally fixed.

- *Maitland Garden Village* (MGV) constructed in 1920, controlled by the CCC until 1991, and currently under subdivision and privatisation, houses up to 2 000 inhabitants. Suggestions have been made to upgrade the village.
- *Maitland Residential and Industrial area* (MRI), is mainly used for residential purposes. These buildings were owned by Transnet, but are currently under subdivision, to be sold to the existing tenants. The industrial area is used for light industrial use serving the needs of the local communities and private investors. The whole area is also characterised by business and commercial use. Suggestions have also been made to upgrade the area.

The minor constraints: These are the land-uses considered to be 'non-fixed'.

- *Valkenberg Hospital eastern campus* (VHEC) is currently underutilised; only a few of the older buildings are being used for health and educational purposes. The rest of the buildings and facilities need renovation.
- All the areas owned by the CCC (except the Peninsula Golf Driving Range, and the RBS) are currently not developed for structural purposes. They provide the local and regional communities with a limited number of public services; such as the open space areas around the Liesbeeck Lake used for recreational purposes, open space areas for the Liesbeeck and Black River Parkways. These are inefficiently managed in terms of their provisions and use of services.
- *The Peninsular Golf Driving Range* (PGDR) is maintained for the exclusive use of the Rotary Club District 235 members. The land is owned by the CCC, and suggestions have been made to develop the area.

- *The Transnet and SARCC* provide limited services to the local and regional community. The Liesbeeck Sportsgrounds are leased by the River Club from Transnet. These facilities are currently being upgraded, i.e. the clubhouse has just been renovated. The services are for the exclusive use of the members of the club. The continuation of the current land-use and developments will depend on the investigations being undertaken by Transnet and SARCC as part of their development framework programme.
- The land controlled by the *NMC land* does not essentially provide any unique services. The Rosedale Collection (Pty) Ltd. has leased the barn complex for three years, and opened a coffee shop which currently operates under full capacity. Additionally UCT has negotiated a 75 year lease, and the NMC land and buildings are incorporated in their Courtyard development. Construction and renovation of the UCT Courtyard development has commenced.
- The land recently acquired by *UCT* (not the land leased by the UCT) serves no special or unique services for the local and regional community. It has been maintained as open space land. The land adjoining the NMC land is currently being developed for executive accommodation, to become a hall of residence in 20yrs time. These will also serve no special or unique purposes for the local and regional communities.
- The area owned by the *Medical Research Council (MRC)*, has been approved for the Gateway Park development, and the building conditions are currently being reviewed by the Administrator. The area serves no particular service at present, and there are no existing structures in the land unit.

### **3.5 Land-use Controls: Zoning and Re-zoning**

The constraints to development are not merely the biophysical, historical and socio-economic features of the CA. Institutional controls, such as the land-use zoning can be equally constraining, and for this reason it was defined as a controlling factor.

Zoning *per se* is an important controlling factor as it is the only land-use controlling system for the CA, and is strengthened by the fact that it is legally binding, administered in terms of

LUPO (section 15, 1985). It also can provide an indication of the scale of potential development not yet taken up, given the scale of undeveloped and under-developed erven.

The effectiveness of the system, i.e. its control and efficiency, has been questioned by the I&APs. Increasing pressures being made on the area accentuated these concerns, and the issue of zoning has come under more criticism. For instance, the way land-use provisions and conditions were undertaken for the UCT Courtyard development and the site for the Proposed Gateway Park development, was a source of contention. The recent studies being undertaken in the package of plans approach, for the Transnet/SARCC land and C-BR site, have also provoked concern about the disposal of public land, and the land-use controls of private and public land.

### **3.5.1 Discussion**

In terms of land-use planning in the CMA, the Guide Plan is a regional planning tool, falling under the Physical Planning Act (No. 88 1967). This is not specific, so urban structure plans have been established at more site specific levels. These plans determine the goals that need to be implemented. Thus land-use control mechanisms such as zoning are used to regulate the goals. These regulations are not necessarily positive or negative; land-uses are prohibited or permitted according to the nature of the use zone in which they occur. These rules and regulations for land-use in the CMA, are defined in the Zoning Scheme which is controlled by the CCC.

As zoning is a form of distribution of competing land-uses, it may be perceived as analytical, compartmentalised and reductionist. However, if an integrated holistic approach is applied then zoning may be perceived as a holistic concept. For instance, in the USA rigorous Zoning Schemes are being replaced by more flexible viable policies which place emphasis on integration, diversity, multiple use, public participation and review zoning (Rabie, Blaignaut and Fatti, 1992).

What is of importance, is that this holistic approach can be attained in the CMA, given that emphasis is placed on the broader, integrated and holistic approach. Thus, in terms of this study, zoning is a significant factor, being the only form of land-use control in the CA. Potentially, this can be applied in a more progressive, flexible manner, where land-use is managed as an integrated system.

### **3.5.2 Methodology**

The existing land-use controls for the CA have been assessed in this section, to determine the various levels of regulations, and to find out which are more restrictive than others. These existing rules and regulations will, in various ways, influence future long or short term land-use planning in the area.

There are varying degrees of land-use control in the Zoning Scheme, which inflict inherently different constraints on the provisions of future development in the area. These have been reviewed and assessed individually as the use zones, rezoning procedures and zoning regulations.

This was achieved by:

- synthesising and assessing the existing use zones in terms of the building and land controls as determined in the Zoning Scheme;
- synthesising and assessing the rezoning regulations according to the different landowners;
- reconsidering the present use of regulations, departures, public participation and time limits in the Zoning Scheme.

The criteria for rating each of these factors varied according to the each 'control'. These have been described respectively. Ratings were given individually to each 'control' for the use zones and rezoning regulations, and categorised as major, medium and minor constraints.

The term 'control' pertains to the varying use, rezoning or other regulations in the Zoning Scheme.

Two constraints maps are provided for the constraints presented by the existing use zone and the rezoning conditions.

### 3.5.3 The ratings and the constraints maps

The ratings of the use zones are discussed, followed by the rezoning conditions, and reconsideration of the other land-use and rezoning regulations.

(a) The existing use zones: (see Map 7)

The controls, rules and regulations defined in the Zoning Scheme, provided the preliminary data on which the assessment was made.

These use zones have been assessed in terms of their existing suitability for development and the findings have been deduced according to two sources: the rules and regulations as established in the Zoning Scheme (see Appendix 3), and a certain amount of personal judgement.

The latter source, personal judgement, was essential in the assessment, giving meaning to the present rules and regulations in terms of the present, often conflicting, demands, changes and concerns being made on the CA.

The major constraints: These are the Public Open Space Use zone (POS); zones for Street Purposes and the Community Facilities Use zone (CFU).

In terms of the Zoning Scheme no buildings are permitted in these areas unless the Council's or Administrator's approval has been provided.

These areas represent the majority of the CA and are defined as Valkenberg Hospital western campus (VHWC), Vincent Pallotti Hospital, ACRC, SAAO, RBS, Transnet/SARCC property and all the land owned and controlled by the CCC, including Malta-Berkley Road link, Valkenberg picnic site. The Peninsula Golf Driving Range is omitted in this category.

The medium constraints: These are the use zones referred to as Undetermined Use (UU); Subdivisional Use zone (SU) and the Single Dwellings Residential Use zone (SDRU).

In terms of the Zoning Scheme no buildings are permitted on UU zone. However, as the land in the CA is owned by the State, buildings are permitted for State use.

These use zones are VHEC, SARCC land on the Liesbeeck Sportsgrounds, and a small portion of land adjoining the Maitland Residential and Industrial area.

Land zoned as Subdivisional, in the context of the study area, means that the land is presently being sold to current tenants, and the area is to be rezoned Residential. This only applies to Maitland Garden Village (MGV).

Buildings for single dwelling units are permitted in areas zoned as Single Dwelling Residential. The Peninsula Golf Driving Range is in this use zone, and is important given that suggestions have been made to develop this area (Boddington, pers. comm., 1994).

The minor constraints: These are the Use zones classified General Residential (GR), General Commercial (GC) and General Business (GB).

In terms of the Zoning Scheme a wide variety of buildings are permitted in these use zones, ranging from blocks of flats to places of worship and business. (See Appendix 3)

There are limited use zones of this category in the study area. Maitland Residential and Industrial area occupies the largest area of both General Residential and General Commercial. The MRC land, on the western boundary, is the other area of General Commercial, rezoned in December 1993. The only area of General Business is the recently rezoned area owned by the NMC, but leased to UCT Courtyard development. The latter two use zones have been a source of contention, given that they do not appear to 'fit in' with the other use zones.

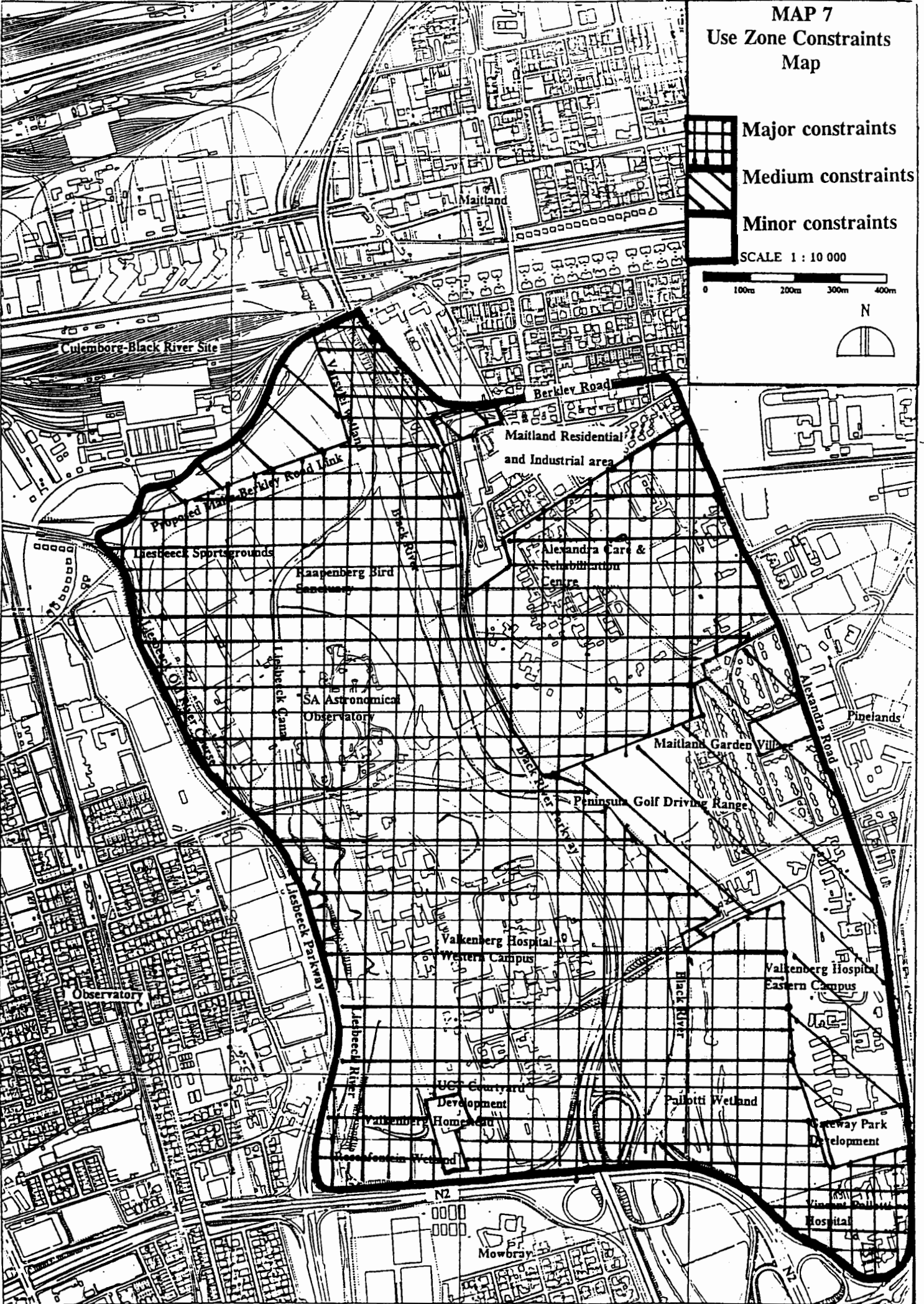
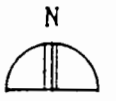
# MAP 7 Use Zone Constraints Map

- Major constraints
- Medium constraints
- Minor constraints

SCALE 1 : 10 000



N



Culemborg-Black River Site

Maitland

Berkley Road

Maitland Residential  
and Industrial area

Liesbeeck Sportsgrounds

Raapenberg Bird  
Sanctuary

Alexandra Care &  
Rehabilitation  
Centre

SA Astronomical  
Observatory

Maitland Garden Village

Pinelands

Peninsula Golf Driving Range

Valkenberg Hospital  
Western Campus

Valkenberg Hospital  
Eastern Campus

UGF Courtyard  
Development

Pallotti Wetland

Gateway Park  
Development

Wetland

Mowbray

Hospital

(b) The rezoning regulations: (see Map 8)

Rezoning is required if land-use changes are made that do not comply with the existing use zone. These are significant given the variety of use zones in the CA.

An open ended assessment of the present rezoning regulations is provided to give meaning to the different levels of control accorded to the different landowners. These have been categorised in terms of their inherent constrictions. These findings are based on a simple understanding of the Zoning Scheme and a certain amount of personal judgement.

The results are listed and the reasons for their classification are presented below.

Major constraint: This refers to *privately* owned or *Council* land. If land-use changes do not comply with the existing use zones provided for a land-unit, the land (private or Council), must be rezoned to allow for land-use changes. The Council's approval is needed before any form of development is permitted on the rezoned land.

Medium constraint: This refers to *State* land. This pertains to most of the CA. Land-use changes are permitted in State property if the developments are deemed necessary for the purpose of that State land-use, i.e. rezoning is not required if the State is developing portions of land for its own use. Rezoning is required only if the land is to be sold or subdivided. Development applications from the potential developers are then provided and must be approved by the Council.

Minor constraint: This refers to the land owned by *Transnet and SARCC* in the CA. Land-use changes are restricted in terms of their CFU and Undetermined Use zone. However, overriding this is the recently developed process of rezoning referred to as 'reaching an agreement'. This is adopted from the planning approach employed in the Waterfront development 'package of plans'. This rezoning system speeds up the process of development. The precinct plans are approved, and a moratorium of three years is established to allow for the development to take place (VAW, 1989).

The use zones and the rezoning categories are the two aspects represented on the map. The proceeding analysis is undertaken to highlight the importance of other zoning considerations.

(c) Reconsideration of the regulations, conditions, departures, public participation and time limits:

These land-use controls are authoritative in nature, allowing limited interaction with the public. They are inherently built in the Zoning Scheme. The parameters set for each factor is determined by the Council or the Administrator. For instance, the Council determines the time limits and all building regulations, conditions and departures are determined by the CCC and/or Administrator. Public participation is also dependent on the Town Clerk (CCC, 1991).

It is the Town Clerk who determines whether public participation is deemed necessary for land-use changes, which sometimes results in short sighted planning.

### **3.6 Summary**

The controlling factors have been rated according to their level of constraint on structural development in the study area. For each controlling factor the selected category of constraints is defined by a range of values. Constraints maps are provided to present the range of values of each controlling factor.



The range of values and selected category of constraints are summarised in Table 3.

**Table 3**

<b>RATING SYSTEM APPLIED TO THE CONTROLLING FACTORS</b>			
<b>Controlling factor</b>	<b>Major constraint</b>	<b>Medium constraint</b>	<b>Minor constraint</b>
Flooding	Below 1:50yr floodline	—	—
Wetlands	RBS, Pallotti, Varsvlei and Rosenfontein	Areas below 1:20yr floodline	—
Historical and Archaeological factors	National Monuments	Historical precincts; Buildings over 50yrs old; Archaeological precincts.	Maitland Garden Village
Land-use	Unconditionally fixed uses	Conditionally fixed uses	Not fixed uses
Use zones	POS; CFU; Street Purposes.	UU; SU; SDRU	GR; GC; GB
Rezoning	Private and Council land	State land	Transnet and SARCC

Having rated the controlling factors in terms of their inherent capability to support structural development, the following chapter combines the different levels of constraints and a composite development constraints map is presented. The limitations to, and the opportunities for development in the CA are then determined.

## **CHAPTER SEVEN**

# **THE DISCUSSION**

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### **1. INTRODUCTION**

The presentation of the overlay technique is reviewed and the composite development constraints map is presented. This identifies the areas intrinsically suited to, or not suited to structural development (see Map 9). The spatial information is then discussed and summarised in text and tabular format, and the limitations to, and opportunities for each controlling factor to support development are determined.

### **2. PRESENTATION OF THE COMPOSITE DEVELOPMENT CONSTRAINTS MAP**

“The composite constraints map is an essential pre-requisite for rational planning at the conceptual and detailed level” (Beaumont, Carter and Gregg, 1975). It enables careful assessment to be made between the inherent capabilities of various land units.

The intrinsic capacity of each controlling factor in the CA for the location of development, is illustrated on the composite development constraints map. In other words, all the constraints maps outlining the constraints imposed by each of the controlling factors, have been combined to produce a final composite map.

The ratings of the appropriate controlling factor in each area of the study site have been superimposed on the base map. The ratings from major to minor constraint of each controlling factor have been combined to produce a final composite map.

The ratings of the appropriate flooding, wetlands and historical and archaeological, and land-use controlling factors in each land unit of the study area have been denoted on the composite map by an alphabetical reference system of A, B, C (see Table 5). The areas of 'no constraint' have been incorporated into this categorisation in order to keep the sequence. These are represented with a '0' (see Table 5). The ratings represent the level of constraint imposed by the controlling factor on development.

The sequence in which the rating digits are marked on the constraints map corresponds to the listing of controlling factors provided in Table 4 below.

**Table 4**

<b>THE SEQUENCE OF THE RATING DIGITS</b>	
<b>Controlling Factor</b>	<b>Alphabetical Position</b>
Flooding	First
Wetlands	Second
Historical and archaeological factors	Third
Land-use and landownership	Fourth

The overall capacity for development in various parts of the CA is indicated by a shading reference. Thus if a major constraints rating occurs in any sequence of rating letters, the area is shaded in a fashion that represents the major constraint. Three different shades are used, and are illustrated in Table 5.

For clarification an example is provided. If the major controlling factors in a land unit are flooding and wetland habitat, the medium constraint is the historical and archaeological aspect, and land-use is not a constraint, the sequence on the map is as follows: AAB0.

**Table 5**

<b>THE ALPHABETICAL REFERENCING AND SHADING SYSTEM</b>		
<b>Shade</b>	<b>Level of constraint</b>	<b>Letter</b>
	Major constraint	A
	Medium constraint	B
	Minor constraint	C
	No constraint	0

The zoning and rezoning controlling factors have been categorised separately because of their abstract, institutional nature. This means that the constraints imposed by zoning and rezoning on a land unit have not been considered in the shading system. The ratings of the 'use zones' have been denoted by a 'U' and the numbers 1,2,3, represent the major to minor constraint. Similarly, the rating for the rezoning procedure has been denoted by an 'R' and the numbers 1,2,3 represent the major to minor constraint (see Table 6).

**Table 6**

<b>THE DIGIT REPRESENTATION FOR THE USE ZONES AND REZONING REGULATIONS</b>	
<b>Constraints Level</b>	<b>Digit Representation</b>
Major constraint	1
Medium constraint	2
Minor constraint	3

The sequence the use zone and rezoning conditions are rated, is shown below in Table 7.

**Table 7**

<b>THE REFERENCING SYSTEM FOR THE USE ZONES AND REZONING CONDITIONS</b>		
<b>Controlling Factor</b>	<b>Alphabetical Position</b>	<b>Referencing system</b>
Use zone	Fifth	U
Rezoning	Sixth	R

An example is provided to clarify the use of the system. Should a land unit be located in the Public Open Space Use zone, which is categorised as a major constraint, then it is represented on the map as 'U1'. Similarly, for rezoning, a land unit located in Council land is considered to be a major constraint, and is presented on the map as 'R1'.

### **3. THE DISCUSSION**

The information presented in spatial format on the map, has been translated into descriptive format, and is referred to as the discussion. This is comprehensive and provides decision-makers and land-use planners with the reasons for the constraints and allows for full accountability.

The information has been discussed according to the land-use, landownership perspective, as delineated in the baseline document (see Map 10). Four 'land-uses' are considered separately, as the controlling factors presented them as separate land units; Raapenberg Bird Sanctuary, the Peninsula Golf Driving Range, Valkenberg Hospital eastern campus (VHEC) and the land below the Medical Research Council (Gateway Park) property (hereafter referred to as the

‘CCC eastern land unit’). The term ‘land unit’ is employed to refer to each of the varying cadastral or quasi-cadastral land parcels.

These cadastral boundaries were employed as a basis for interpretation, as it is assumed that planning in the area, in the short (5-10yrs) and the long term (10-30yrs), will probably take place within these existing parameters. It therefore appeared to be more effective to interpret the data in this manner. The discussion merely provides the qualitative data for each land-unit.

Each designated land unit is discussed in terms of the constraints imposed by the controlling factor on development. The information for the discussion is interpreted from the composite development constraints map (see Map 9), and obtained from the individual constraints maps (Maps 3-8) and the discussion section on each controlling factor (see Chap6, no.3).

The sequence of letters corresponding to each land unit denoted on the map are defined to guide the reader. A summary section of the limitations and/or opportunities presented by the controlling factor to support development is also provided. In addition, a summary table is presented at the end of this section. These should be read with the composite constraints map.




### **3.1 Raapenberg Bird Sanctuary (RBS) (AA0AU1R1)**

#### The development constraints:

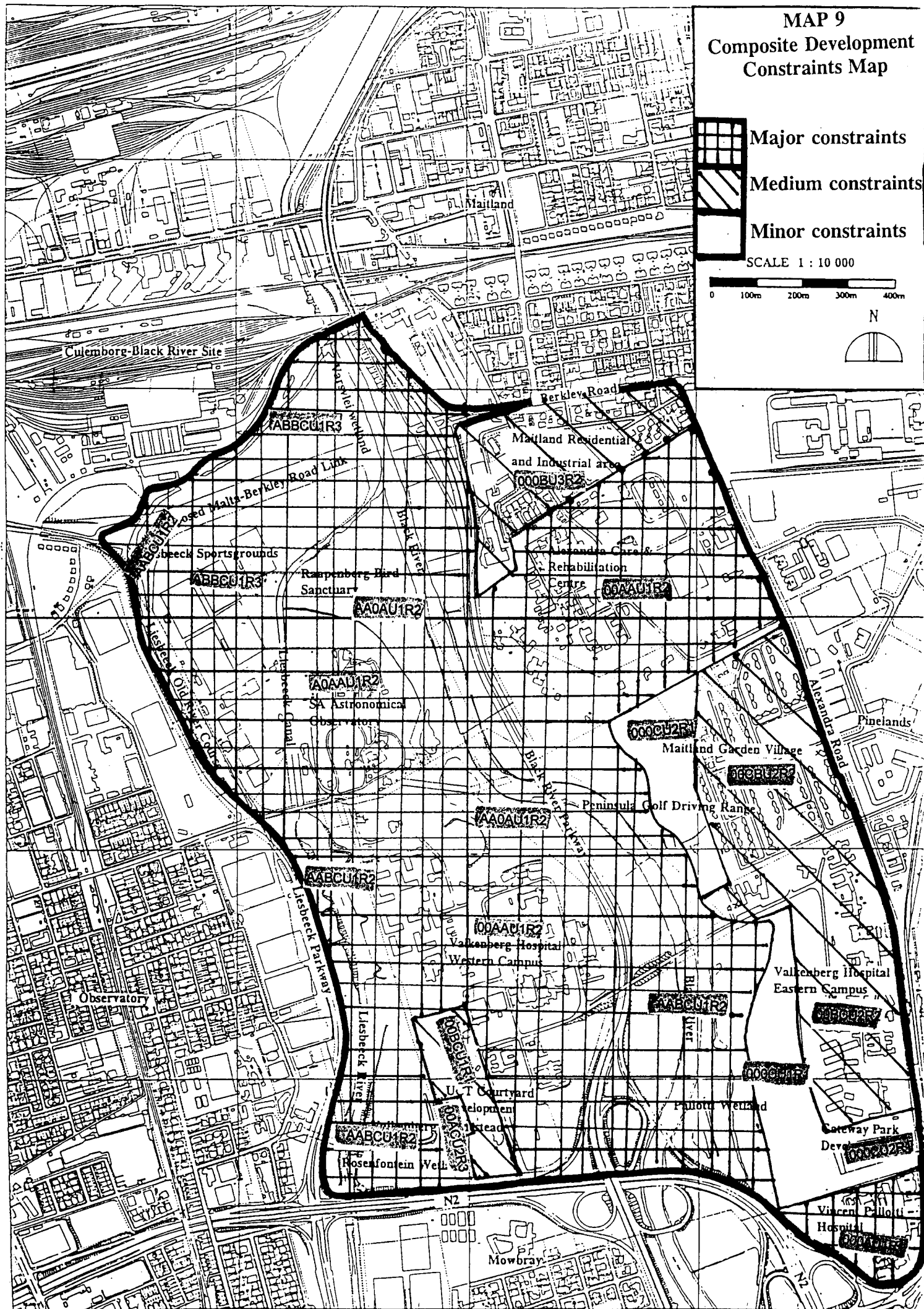
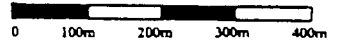
The sanctuary is naturally a wetland which contains the highest proportion of indigenous species and habitat types in the CA, and is considered to be the most conservation worthy land unit. The wetland is also of regional significance, as it is presently an important wetland for avifauna, given the limited and threatened number of wetland areas in the Peninsula and its vicinity.

Flooding is the main physical constraint to development but is fundamental to the wetlands, i.e. it is naturally hazardous to human well-being and safety, thus most unsuitable for structural development. Overcoming this constraint entails considerable expenditure, which could prohibit development.

# MAP 9 Composite Development Constraints Map

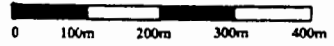
-  Major constraints
-  Medium constraints
-  Minor constraints

SCALE 1 : 10 000

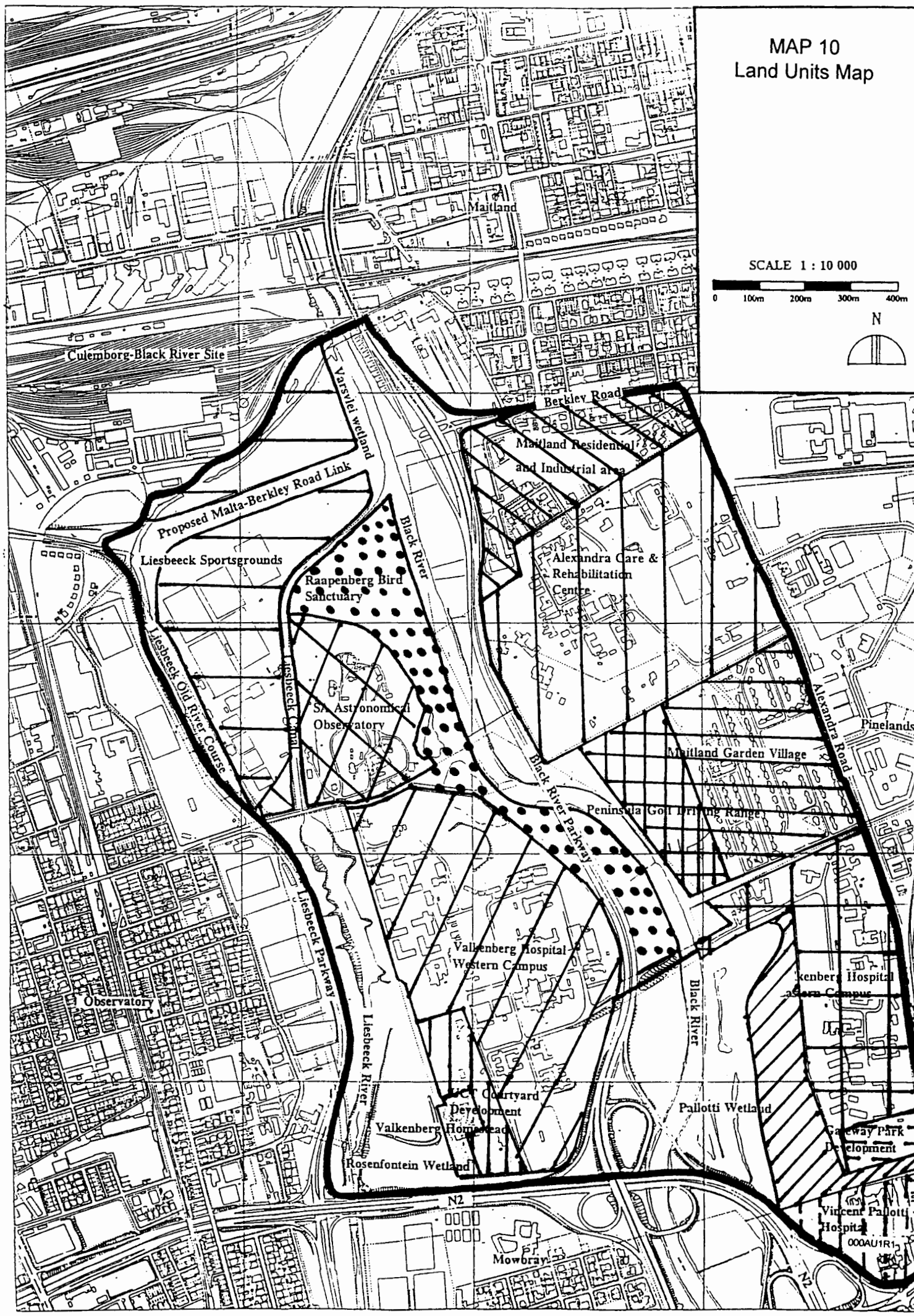


# MAP 10 Land Units Map

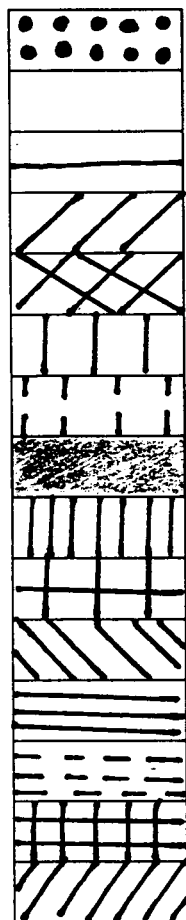
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**LEGEND FOR MAP 10**



- Raapenberg Bird Sanctuary
- CCC Land
- Transnet and SARCC Land
- Valkenberg Hospital western campus
- South African Astronomical Observatory
- Alexandra Care and Rehabilitation Centre
- Vincent Palotti Hospital
- National Monuments Council Land
- UCT Land
- Valkenberg Hospital eastern campus
- Maitland Residential and Industrial area
- Maitland Garden Village
- Medical Research Council
- Peninsula Golf Driving Range
- CCC Eastern Land Unit

The sanctuary status of the land unit means it is an unconditionally fixed land-use, i.e. it has statutory status. This entails that the conservation worthiness of the area has been recognised, but actual statutory protection is weak. Maintenance funds for the land unit are also limited. Nevertheless, the sanctuary does provide a unique service to the local and regional communities of the CMA. This service however, is not utilised to its full extent as public access is restricted (MPhil class, 1994).

The area is located within the Community Facilities Use (CFU) zone, which prohibits any types of buildings until the CCC grants its consent for the structure.

The rezoning procedures require that the CCC or Administrator concede to the land-use change. A significant factor is that the zoning regulations restrict public review of the development or land-use changes, allowing the Council full rights to determine the level of development it deems necessary, without consulting the I&APs.

Summary:

- The biophysical and land-use controlling factors, use zone and rezoning conditions impose major limitations on development.
- There are no historical factors in the land unit.

### **3.2 The Cape Town City Council (CCC) Land (AABCU1R2)**

This refers to all the land owned or controlled by the CCC, including the proposed Malta-Berkley road link, but excluding the Peninsula Golf Driving Range, the CCC eastern land unit, and Raapenberg Bird Sanctuary.

The controlling factors:

The Liesbeeck River, the Old Liesbeeck River, the Liesbeeck Channel and the Black River (i.e. the main water bodies in the CA) are the predominant natural physical features in this land unit. These directly affect the adjoining areas of land, which means that flooding is

essentially the major physical constraint in the area, i.e. all the land is prone to flooding. They are also a fundamental resource for the continuation for the wetland areas, and provide an aquatic habitat for the avifauna that utilise the area.

The wetland areas of Rosenfontein, Pallotti and Varsvlei are the most significant biological and regional constraint to development. They provide a important habitat for the avifauna in the CMA. For instance, the White Pelican, a Red Data species, frequently uses these habitats. These areas are also of regional significance given that they are remnants of an extensive wetland system.

There are two archaeological precincts, one in the Liesbeeck Lake and surroundings, the other adjoining the Malta/Berkley Road reserve. These have not been investigated, but could be potential assets to society.

The land-uses are not fixed. They provide limited services to the present local and regional community. Certain services such as the picnic area below Valkenberg Homestead are rarely used by the public. This may be attributed to the fact that accessibility is limited, or that the services are not sufficient to encourage public use.

The CFU and Public Open Space Use zones imply that development is restricted without consent from the Council. Development proposals that do not comply with the use zones should be rezoned. The areas zoned for Street Purposes restrict development *per se*, but naturally allow for road development, i.e. the proposed Malta/Berkley Road link, or the extension or expansion of present road systems. Financial constraints have however, restricted this form of development.

The rezoning procedures require that the CCC or Administrator concedes to the land-use change. The zoning regulations restrict public review of the development or land-use changes, allowing the Council full rights to determine the level of development it deems necessary, without consulting the I&APs.

### Summary:

- The biophysical aspects impose major limitations on structural development.
- The archaeological features are potential assets and could hinder development in the designated precinct.
- The zoning and rezoning conditions could restrict structural development.
- The non-fixed land-use nature of the area is suitable for development, given that improved services and public accessibility is required.

### **3.3 Transnet and SARCC Land (ABBCU1R3)**

#### The controlling factors:

Flooding is the greatest physical constraint, considering that the area was formerly a wetland (see Appendix 2). The flooding problem could be overcome technologically, but this could entail considerable expenditure which may jeopardise development opportunities.

The area is also of biological importance, providing refuge for the avifauna. This is most apparent along the waterways and unused areas of land. These areas are currently underutilised in terms of land-use, but provide essential habitat for the birdlife.

The 'clubhouse' is over 50yrs and is considered to have conservation potential. The building has recently been upgraded by the River Club, for the exclusive use of their members. There are also two archaeological precincts located at the Old Liesbeeck and Black River confluence, which are of potential significance.

The current land-use is not fixed. This is supported by the fact that the area is being investigated as part of the Transnet/SARCC Development Frameworks. Similarly, since 1987 a number of development proposals have been suggested. In addition the Liesbeeck Sportsgrounds, occupying the core area, is currently being leased to the River Club until December 1995. The existing facilities, the clubhouse, golf driving range and tennis courts, are being upgraded to provide recreational services to the club members. The area is therefore, not considered to be an important service for the local or regional community.

The CFU and Undetermined Use zones imply that development is restricted unless the CCC grants consent. Development proposals that do not comply with the use zones should be rezoned. Public review and participation is restricted.

The rezoning conditions however foster structural development. The principle of 'reaching an agreement' has been adopted, which means that the precinct plans, rather than site development plans or building plans, are approved and a moratorium of 3 years is established to allow for development (VAW, 1989).

Summary:

- The biophysical factors impose major limitations on development.
- The use zones restrict development.
- The historical and archaeological factors could limit the type of development.
- The non-fixed status of the present land-use and the rezoning procedures are suited to development.

### **3.4 Valkenberg Hospital Western Campus (VHWC) (00AAU1R2)**

The controlling factors:

Most of the hospital land is located above the 1:50yr floodline, thus flooding is not deemed to be a hazard. Only a small portion of land on the western boundaries of the hospital falls within the flood prone areas.

There are no features considered to be of biological significance.

Being an historical precinct the administration area and outbuildings are culturally significant. The main administration building is a National Monument, additionally there are a number of buildings that have conservation potential.

The land is considered to be unconditionally fixed providing the local and regional communities of the CMA, essential and unique health care, forensic and psycho-geriatric services. There are however large parcels of undeveloped land, that are currently rarely used by the existing patients, staff or the public.

Zoning conditions of CFU imply that development is restricted, and should it be deemed necessary, the Council's approval must be obtained.

Rezoning conditions pertaining to State land, allow for structural development to take place exclusively for institutional use. Should the land or part thereof, be sold or subdivided the land must be rezoned and approved of by the Council or Administrator.

Summary:

- The biophysical characteristics of the area do not impose limitations on development.
- The historical aspects impose major limitations on development, especially in the area surrounding the main administration building.
- The unconditionally fixed status of the land-use imposes restrictions on development.
- The use zone and rezoning conditions restrict development for mainly institutional use.

### **3.5 The South African Astronomical Observatory (SAAO) (00AAU1R2)**

The controlling factors:

The majority of the land is located above the 1:50yr floodline; only a small low lying area located alongside the RBS is prone to flooding. Similarly, the area is also not considered to be of biological importance.

The land unit is however, an historical precinct, with a number of outbuildings older than 50yrs that have conservation potential, and the main building is a National Monument.

The area is deemed to be unconditionally fixed. Even though the 'observatory' services *per se* are obsolete, the SAAO provides essential research services, and image processing facilities for the research station at Sutherland. Public access is restricted however.

The SAAO is located within the CFU zone which restricts any form of development until the Councils consent is provided. Moreover, being controlled by the Foundation for Research and Development (FRD) the rezoning conditions allow for development exclusively for institutional purposes, but should the land or part thereof, be sold or subdivided the land must be rezoned and approved of by the Council or Administrator.

#### Summary:

- The biophysical factors, excluding the low-lying areas, do not impose limitations on development.
- The zoning conditions, allow for restricted development.
- The unconditionally fixed status of the land and the historically important factors impose major limitations on development.

### **3.6 Alexandra Care and Rehabilitation Centre (ACRC) (00AAU1R2)**

#### The controlling factors:

The land is located above the 1:50yr floodline thus is not prone to flooding. It is also not an area deemed to be of biophysical significance. Historically, however, the ACRC is important considering that the complex is an historical precinct, and the main administration building has conservation potential. Furthermore, the National Monument, Nieuwe Molen, is located within the midst of the hospital, and is currently being renovated. It has been suggested that this will be opened to the public (Strauss, pers. comm., 1994).

The ACRC is an unconditionally fixed land-use. It is the only hospital in the CMA catering for congenitally retarded and brain damaged patients, and serving the local and regional community. The undeveloped areas in the hospital complex, represent important open space areas for the patients. Public access however is restricted.

Zoning conditions of CFU implies that development is prohibited, and should it be deemed necessary, the Council's approval must be obtained.

Rezoning conditions pertaining to State land, allow for structural development to take place exclusively for institutional use. Should the land or part thereof, be sold or subdivided the land must be rezoned and approved of by the Council or Administrator.

Summary:

- The biophysical characteristics of the area do not impose limitations on development.
- The rezoning conditions restrict development.
- The unconditional status of the land-use, the historical aspects and the use zone impose major restrictions on development.

### **3.7 Vincent Pallotti Hospital (000AU1R1)**

The controlling factors:

The land is situated above the 1:50yr designated floodline, so is not prone to flooding. Additionally, it is not considered to be an area of biological or historical significance.

The hospital provides essential health services to the local and regional communities of the CMA and is, thus, an unconditionally fixed land-use.

The zoning conditions of CFU prohibit any development without the consent of the CCC. Similarly, the rezoning conditions for privately owned land, require that consent be obtained from the Council.

Summary:

- The biophysical factors do not impose limitations on development.
- There are no historical aspects of importance.
- The unconditionally fixed nature of the hospital and the zoning and rezoning conditions impose major restrictions on development.

### **3.8 The National Monuments Council land (NMC) (00ACU3R2)**

#### The controlling factors:

The land unit is located above the 1:50yr floodline thus is not prone to flooding. Similarly, it is not considered to be of biological significance.

Historically, the Valkenberg Homestead is a National Monument and the outbuildings have conservation potential. The land unit is also situated within an archaeological precinct.

The land-use is not fixed. The land has been leased to UCT for 75 years. The Homestead is currently being redeveloped as part of the UCT Courtyard development. The outbuildings are leased by Rosedale Collections, but there are plans to incorporate the complex into the UCT Courtyard development. These developments will be used as executive accommodation for a 20yr interim period, and will then revert to UCT for residential use. These developments will therefore, provide limited services to the local and regional public.

The area is zoned as General Business, which permits a number of land-uses (see Appendix 3). The land is managed by the National Monuments Council, but is subject to the Educational Council. This means that State rezoning conditions apply, i.e. developments for the use of the NMC are permitted, but should the land or part thereof, be sold or subdivided the land must be rezoned and approved of by the Council or Administrator.

#### Summary:

- The biophysical factors do not impose limitations on development.
- The General Business Use zone allows for the development of a number of building types (see Appendix 3). These have been taken up by the UCT developers, conditions have been approved of by the Council and the development is underway.
- The non-fixed status of the land-use suggests that future developments are possible, but consideration should be given to the public.
- The historical and archaeological factors impose limitations on development.

### 3.9 UCT Land (00BCU1R1)

#### The controlling factors:

The area is located above the 1:50yr flood line and is not considered to be of biological significance. The southern section of the land unit however, is located in the Valkenberg archaeological precinct and there are two buildings of over 50yrs old which are of conservation significance.

The area is not a fixed land-use. The southern portion of the land is currently being developed for executive accommodation to be managed by Gallic Construction. These will then revert to UCT control in 20yrs time and become residential units for UCT students. The northern portion of the land unit is currently undeveloped but is maintained as open space. There are suggestions that this area be developed further (MPhil class, 1994).

Community Facilities Use zone, implies that development *per se* is prohibited, and should it be deemed necessary, the Councils approval should be obtained. The land adjoining the NMC property however, obtained departures and temporary departures to allow for the present development, and the buildings conditions were approved in March 1993.

Rezoning conditions applicable to private landowners applies in this case. UCT is regarded as the private owner, thus any further land-use changes that do not conform with the CFU zone, must be rezoned and developments approved of by the Council. The rezoning conditions were however, bypassed in the planning stage of the UCT Courtyard development. Departures and temporary departures were obtained.

#### Summary:

- The biophysical factors do not impose limitations on development.
- The historical and archaeological factors could restrict development.
- The non-fixed status of the land-use suggest that future developments are feasible.
- The zoning and rezoning conditions impose restrictions on development.

### **3.10 Valkenberg Hospital Eastern Campus (VHEC) (00BCU1R2)**

#### The controlling factors:

The land unit is located above the 1:50yr designated floodline, therefore is not prone to flooding. Similarly, there are no biologically significant wetland habitats located in the land unit.

Historically the VHEC is important as the main buildings of the hospital are in an historical precinct and there are a number of buildings over 50yrs old and of conservation potential.

The land unit is not a fixed land-use, providing limited services to the local and regional public of the CMA. There are only a few buildings that are currently being used for health and educational purposes. Additionally, the area occupies approximately 15 ha of the study site and public access is limited (MPhil class, 1994).

The Undetermined Use zoning implies that development is restricted without the consent of the Council.

Rezoning procedures permit development exclusively for institutional purposes, provided that the Council agrees to the development. Should the land or part thereof, be sold or subdivided the land must be rezoned and approved of by the Council or Administrator.

#### Summary:

- The biophysical characteristics and the non-fixed land-use characteristic do not impose limitations on development.
- The zoning and rezoning conditions restrict development.
- The historical factors impose limitations on development.

### **3.11 The Maitland Residential and Industrial area (MRI) (000BU3R2)**

#### The controlling factors:

The area is located above the 1:50yr floodline and there are no biologically significant factors in the land unit. Additionally there are no historical or archaeological factors considered to be important in the area.

The land-use is considered to be conditionally fixed, given that the area is already developed for residential, business and light industrial use and provides services to local and regional communities. The residential portion of the area was owned by Transnet, but the dwellings have been, and are currently being sold to current tenants.

A very small area is zoned as Undetermined Use. The majority of the area is zoned General Residential, and a smaller portion of the area, adjoining the Black River Parkway, is zoned General Commercial. These latter two use zones allow for the development of any building so long as they comply with the Zoning Scheme and the conditions of building, as determined by the Council (see Appendix 3). Developments which do not comply with the use zones must be rezoned, and consent must be obtained by the CCC.

#### Summary:

- The biophysical factors do not impose limitations on development.
- There are no historical factors of importance.
- The conditional status of the land unit could hinder further development.
- The zoning conditions suggest that the land is suitable for development.
- Rezoning conditions could limit development.

### **3.12 Maitland Garden Village (00CBU2R2)**

#### The controlling factors:

The village is located above the 1:50yr floodline and is not considered to be of biological importance.

The cultural element of the village is considered to be important. Constructed in the 1920s, it has acquired a unique characteristic, and 'sense of place'.

The conditionally fixed status of the land-use means that the land, controlled by the CCC until 1990, is currently under subdivision and the residential dwellings are being sold to the current tenants. It has been suggested that the village be upgraded and densification should taken place.

The village is zoned Subdivisional Use and the residential units are being subdivided. The land will be rezoned to General Residential, allowing for more development. (Currie, pers. comm., 1994).

Summary:

- The biophysical factors do not impose limitations on development.
- The cultural aspect is an important consideration and could influence development.
- The conditional status of the land-use and Subdivisional Use zones status impose limited restrictions on development.

### **3.13 The Medical Research Council Land (MRC) (000U3R1)**

The controlling factors:

The area is located above the 1:50yr floodline and is not considered to be of biological significance. Similarly, there are no important historical factors.

In addition, the land-use is not fixed, and is currently waiting redevelopment. Presently, the land does not provide any essential or unique services; it is an open piece of land that was part of the Valkenberg Hospital east complex. This was sold to the MRC, and then development proposals were considered, first by the Argus Group, and then by the Gateway Park development.

In November 1993 it was rezoned from Undetermined to General Commercial to allow for the Gateway Park development. The plans are to build a four storey office and warehousing development. The application to amend the rezoning conditions is currently being assessed by the Administrator.

Summary:

- The biophysical factors of the land unit do not impose limitations on development.
- There are no historical factors of importance.
- The non-fixed status of the land-use and the current rezoning procedures, entail that the land is to be developed for general commercial purposes.

### **3.14 The Peninsula Golf Driving Range (00CU2R1)**

The controlling factors:

Flooding is not an inherent constraint in the land-unit, but the 1:50yr floodline transects the lower lying areas on the western boundary. The area is not considered to be of biological significance. Similarly, there are no historical factors of importance.

The land-use is not fixed. It is maintained for the exclusive use of the Rotary Club members of District 235 who manage the present facilities, i.e. a small club house and driving range. It provides limited services to the local and regional communities.

The land unit is zoned as Single Dwellings Residential Use, allowing for the construction of one storey buildings. Suggestions have been made to develop the area for residential purposes (Boddington, pers. comm., 1994)

The rezoning procedures require the CCC's or Administrator's consent to the land-use change. The zoning regulations restrict public review of the development or land-use changes, allowing the Council full rights to determine the level of development it deems necessary, without consulting the I&APs.

**Summary:**

- The biophysical factors do not impose limitations on development.
- There are no historical factors of importance
- The non-fixed status of the land and the SDR Use zone suggest that development is feasible.
- The rezoning conditions could hinder development.

**3.15 The CCC Eastern Land-Unit (000CU1R1)**

Flooding is not considered to be a problem in this area as it is located above the 1:50yr floodline. The land-unit is also not considered to be of biological significance. Similarly there are no historical factors of importance.

The existing land-use does not provide essential services to the local or regional community, and is presently open space. A number of development proposals have been considered, the most notable being the World of Birds, monkey and parrot park project (MPhil, 1994). This was aborted due to financial constraints.

The land unit is zoned for Public Open Space. It was rezoned from Undetermined Use and Community Facilities Use zones in 1990 to accommodate the monkey and parrot park proposal. Development *per se* is restricted in this use zone and the consent of the Council must be obtained.

The rezoning procedures require that the CCC or Administrator consent to the land-use change. A significant factor is that the zoning regulations restrict public review of the development or land-use changes, allowing the Council full rights to determine the level of development it deems necessary, without consulting the I&APs.

**Summary:**

- The biophysical factors do not impose limitations on development.
- There are no historical factors of significance.

- The non-fixed status of the land-use suggests that development is feasible.
- The POS Use zone restricts development.
- Rezoning conditions could hinder development.

#### 4. THE SUMMARY TABLE

The land units are defined and their range of values, i.e. the constraints imposed by the controlling factors on the suitability of development the area are presented. The factors which are not mentioned in relation to the land units are not considered to be a constraint, i.e. flooding is not considered to be a constraint for Valkenberg Hospital western campus. The rating sequence in which the controlling factors are marked on the composite constraint map are provided (see Map 9).

**Table 8**

<b>SUMMARY TABLE OF SPATIAL INFORMATION</b>			
<b>Land unit</b>	<b>Major constraints (A) — (1)</b>	<b>Medium constraints (B) — (2)</b>	<b>Minor constraints (C) — (3)</b>
RBS (AA0AU1R2)	<ul style="list-style-type: none"> <li>• Flood prone area</li> <li>• Biological and regional wetlands</li> <li>• Unconditionally fixed land-use</li> <li>• CFU zone</li> <li>• Rezoning for Council land</li> </ul>		
CCC land (AABCU1R2)	<ul style="list-style-type: none"> <li>• Flood prone area</li> <li>• 3 main wetland areas; Pallotti, Varsvlei and Rosenfontein.</li> <li>• CFU, POS and Street purposes Use zones</li> <li>• Rezoning for Council land</li> </ul>	<ul style="list-style-type: none"> <li>• Wetland areas</li> <li>• Two archaeological precincts</li> </ul>	<ul style="list-style-type: none"> <li>• Land is not fixed</li> </ul>

Land unit	Major constraints (A) — (1)	Medium constraints (B) — (2)	Minor constraints (C) — (3)
Transnet and SARCC land (ABBCU1R3)	<ul style="list-style-type: none"> <li>• Naturally a flood prone area</li> <li>• CFU zone</li> </ul>	<ul style="list-style-type: none"> <li>• Wetland significance</li> <li>• Clubhouse is of conservation potential</li> <li>• Two archaeological precincts</li> </ul>	<ul style="list-style-type: none"> <li>• Not a fixed land-use</li> <li>• 'Reach an agreement' policy for rezoning</li> </ul>
VHWC (00AAU1R2)	<ul style="list-style-type: none"> <li>• Unconditionally fixed land-use</li> <li>• Main administration building is a National Monument</li> <li>• CFU zone</li> </ul>	<ul style="list-style-type: none"> <li>• Buildings of over 50yrs of conservation potential</li> <li>• Historical precinct</li> <li>• State conditions for rezoning apply</li> </ul>	
SAAO (A0AAU1R2)	<ul style="list-style-type: none"> <li>• Unconditionally fixed land-use</li> <li>• Main administration building is a National Monument</li> <li>• Small portion of land is low lying</li> </ul>	<ul style="list-style-type: none"> <li>• Buildings over 50yrs of conservation potential</li> <li>• Historical precinct</li> <li>• State rules apply for zoning</li> </ul>	
ACRC (00AAU1R2)	<ul style="list-style-type: none"> <li>• Unconditionally fixed land-use</li> <li>• Nieuwe Molen, a National Monument is located in the complex</li> <li>• CFU zone</li> </ul>	<ul style="list-style-type: none"> <li>• Buildings of over 50yrs of conservation potential</li> <li>• State rules for rezoning apply</li> </ul>	
Vincent Pallotti Hospital (000AU1R1)	<ul style="list-style-type: none"> <li>• Unconditionally fixed land-use</li> <li>• CFU zone</li> <li>• rezoning for private ownership apply</li> </ul>		
NMC land (00ACU3R2)	<ul style="list-style-type: none"> <li>• Valkenberg Homestead is a National Monument</li> </ul>	<ul style="list-style-type: none"> <li>• Buildings of over 50yrs of conservation potential</li> <li>• An archaeological precinct</li> <li>• Rezoning conditions to State land applies</li> </ul>	<ul style="list-style-type: none"> <li>• Land-use is not fixed</li> <li>• Area is zoned for General Business</li> </ul>
UCT land (00BCU1R1)	<ul style="list-style-type: none"> <li>• CFU zone</li> <li>• Rezoning conditions for privately owned land</li> </ul>	<ul style="list-style-type: none"> <li>• Buildings of over 50yrs of conservation potential</li> <li>• An archaeological precinct</li> </ul>	<ul style="list-style-type: none"> <li>• Land-use is not fixed</li> </ul>

<b>Land unit</b>	<b>Major constraints (A) — (1)</b>	<b>Medium constraints (B) — (2)</b>	<b>Minor constraints (C) — (3)</b>
VHEC (00BCU2R2)		<ul style="list-style-type: none"> <li>• Buildings of over 50yrs of conservation potential</li> <li>• Undetermined Use zone</li> <li>• Rezoning for State land applies</li> </ul>	<ul style="list-style-type: none"> <li>• Land-use is not fixed</li> </ul>
MRI area (000BU3R2)		<ul style="list-style-type: none"> <li>• Conditionally fixed land-use</li> <li>• Rezoning conditions for privately owned land</li> </ul>	<ul style="list-style-type: none"> <li>• General Residential, General Commercial and a small portion of Undetermined Use zones</li> </ul>
MGV (00CBU2R2)		<ul style="list-style-type: none"> <li>• Conditionally fixed land-use</li> <li>• Subdivided Use zone</li> <li>• Rezoning conditions for privately owned land</li> </ul>	<ul style="list-style-type: none"> <li>• Village has an historical 'sense of place'</li> </ul>
MRC (000CU2R1)	<ul style="list-style-type: none"> <li>• Rezoning conditions for State land</li> </ul>		<ul style="list-style-type: none"> <li>• Land-use is not fixed</li> <li>• General Commercial Use zone.</li> </ul>
Peninsula Golf Driving Range (000CU2R1)	<ul style="list-style-type: none"> <li>• Rezoning conditions for CCC land</li> </ul>	<ul style="list-style-type: none"> <li>• Zoned as Single dwellings residential</li> </ul>	<ul style="list-style-type: none"> <li>• Land-use is not fixed</li> </ul>
CCC eastern land unit (000CU1R1)	<ul style="list-style-type: none"> <li>• Zoned as POS</li> <li>• Rezoning conditions for CCC land</li> </ul>		<ul style="list-style-type: none"> <li>• Land-use is not fixed</li> </ul>

The recommendations and conclusions of the findings are presented in the following chapter.

## **CHAPTER EIGHT**

# **CONCLUSIONS & RECOMMENDATIONS**

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### **1. INTRODUCTION**

The constraints imposed by the controlling factors on development form the basis of these final conclusions and recommendations. The conclusion for each land unit is presented and the recommendations are then provided. The land-use policies and plans and social issues have also been reconsidered. Concluding comments are provided at the end of this section.

### **2. RAAPENBERG BIRD SANCTUARY**

The controlling factors impose major limitations on development. The RBS is inherently a flood prone area, it is of biological and regional significance and is fixed in terms of its 'sanctuary' status providing a unique service to the local and regional public of the CMA. Furthermore, the zoning system restricts any form of structural development in the land unit. The technical, social and economic costs of overcoming these constraints are high enough to ensure that development is not feasible.

#### Recommendations:

- RBS should be excluded from any form of structural development.
- RBS should be maintained as a sanctuary, but public access and management of the area should be upgraded.
- The sanctuary should be extended to incorporate the Rosenfontein, Varslvei and Pallotti wetlands.
- The water courses (the Liesbeeck and Black Rivers, the Old Liesbeeck River Course, the Liesbeeck canal and the Liesbeeck Lake) and the flood prone areas, excluding the

Liesbeeck Sportsgrounds, should also be included in a greater sanctuary. This could be incorporated into a Metropolitan Open Space System (MOSS).

- The inherent ecological functions should be exploited and used for flood conveyance and storage and water pollution control.

### **3. THE CCC LAND**

The CCC land, excluding the RBS, Peninsula Golf Driving Range and the CURRICULUM eastern land unit, are not suitable for development. The biophysical nature of the area, the zoning characteristics and the areas of historical importance impose several limitations on development. The economic, social and technical costs of overcoming these constraints are high enough to ensure that development is not feasible.

#### Recommendations:

- The CCC land should be excluded from structural development.
- The wetland areas within the CCC land of Rosenfontein, Varsvlei and Pallotti should be incorporated into the Raapenberg Bird Sanctuary.
- The inherent ecological functions of the wetlands should be used for flood conveyance and storage and water pollution control.
- The watercourses (the Liesbeeck and Black Rivers, the Old Liesbeeck River Course, the Liesbeeck canal and the Liesbeeck Lake) and the flood prone areas, excluding the proposed Malta/Berkley Link, should be incorporated into the RBS.
- Public facilities, suited to the inherent open space, undeveloped nature of the existing area, should be provided to encourage greater public access and use.
- The two archaeological precincts should be investigated prior to development.
- Public participation should be encouraged in future land-use planning in the area.
- Should the land or part thereof, be sold or subdivided it is recommended that the IEM procedure be followed to assess any proposed future land-use.

#### **4. TRANSNET AND SARCC LAND**

The Transnet and SARCC land currently occupied by the Liesbeeck Sportsgrounds, contains several conflicting limitations to, and opportunities for development. The limitations imposed by the biophysical factors result in development being unsuitable, while the land-use and rezoning factors encourage development.

##### Recommendations:

- Structural development should be excluded from this area. This is justified by the fact that the biophysical limitations, flooding and wetland habitat, can be overcome by technical skills, but this could entail considerable expenditure and the loss of future options.
- The archaeological precinct situated at the Old Liesbeeck River and Black River confluence point should be investigated prior to development.
- Should the land or part thereof, be sold or subdivided it is recommended that the IEM procedure be followed to assess any proposed future land-use.
- Public participation should be retained in the 'package of plans' approach to development.
- The composition of the infill material underlying the Transnet and SARCC land, should be investigated prior to development.

#### **5. VALKENBERG HOSPITAL WESTERN CAMPUS (VHWC)**

The controlling factors dictate that the VHWC should remain and continue to provide for health care, forensic and psycho-geriatric and neurological services to the local and regional community.

##### Recommendations:

- Structural development should be restricted to institutional activities and the development plans should allow for public participation.

- Prior to development, due consideration should be given to the historical components of the hospital i.e the outbuildings of conservation potential and the main administration building which is a National Monument.
- Undeveloped portions of the hospital area should be made more accessible to the public for recreational use.
- Should the land or part thereof, be sold or subdivided it is recommended that the IEM procedure be followed to assess any proposed future land-use.

## **6. THE SOUTH AFRICAN ASTRONOMICAL OBSERVATORY (SAAO)**

The controlling factors suggest that the SAAO remains and continues to provide educational and research facilities, and image processing for the observing station in Sutherland.

### Recommendations:

- The research and educational facilities should be improved, encouraging greater public access and involvement.
- Structural development should be restricted to solely institutional activities and the development plans should allow for public participation, which currently is restricted.
- Due consideration should be given to the historical and cultural component of the institution.
- Should the land or part thereof, be sold or subdivided it is recommended that the IEM procedure be followed to assess any proposed future land-use.

## **7. ALEXANDRA CARE AND REHABILITATION CENTRE (ACRC)**

The controlling factors dictate that the ACRC be retained as a functioning hospital for congenitally retarded and brain damaged patients.

### Recommendations:

- Structural development should be restricted to institutional activities and the development plans should allow for public participation, which currently is restricted.

- Should the land or part thereof, be sold or subdivided it is recommended that the IEM procedure be followed to assess any proposed future land-use.
- Once restored, the Nieuwe Molen National Monument should be made accessible to the public, i.e. for recreational or functional activities.

## **8. VINCENT PALLOTTI HOSPITAL**

The controlling factors dictate that the Vincent Pallotti Hospital should remain as a health care service, for the local and regional communities.

### Recommendations:

- Should structural development be deemed necessary for institutional activities, the Council must approve the development proposal.
- Should the land or part thereof, be sold or subdivided it is recommended that the IEM procedure be followed to assess any proposed future land-use.

## **9. THE NATIONAL MONUMENTS COUNCIL (NMC) LAND**

The NMC land currently contains conflicting limitations to, and opportunities for, development. The limitations imposed by the historical and archaeological factors and rezoning conditions result in development being restricted, while the biophysical aspects, the land-use and zoning factors encourage development.

Based on the fact that the land has been leased to UCT for 75 years, and that the Homestead and outbuildings are currently being renovated and upgraded as part of the UCT Courtyard development, development cannot be prohibited. Development should therefore continue.

### Recommendations:

- An archaeologist should be present during construction in the archaeological precinct.
- The existing edifice of the Homestead and outbuildings should be maintained.
- Future developments in the land-unit should allow for greater public participation.

- Should the land or part thereof, be sold or subdivided it is recommended that the IEM procedure be followed to assess any proposed future land-use.

## **10. THE UCT LAND**

The controlling factors impose different limitations on development in the land unit. The biophysical factors and the non-fixed status of the land-use suggest that development is feasible. The Community Facilities Use zone and rezoning conditions, and the historical and archaeological factors render the land as unsuitable for development.

Based on the fact that the UCT development is at an advanced stage of construction, development cannot be prohibited. The areas however, which are currently underdeveloped should be reviewed.

### Recommendations:

- Should the land or part thereof, be sold or subdivided it is recommended that the IEM procedure be followed when assessing potential land-use.
- An archaeologist should be present during construction if any developments are undertaken in the archaeological precinct, in the northern section of the property.
- The buildings of conservation potential should be considered in future land-use planning and development.

## **11. VALKENBERG HOSPITAL EASTERN CAMPUS (VHEC)**

The controlling factors suggest that the VHEC should be redeveloped. There are no limitations imposed by the biophysical factors and the existing non-fixed status of the land-use. There are however, a number of buildings over 50yrs old which are of conservation potential and the use zone and rezoning conditions could restrict development.

**Recommendations:**

- Should the land or part thereof, be sold or subdivided it is recommended that the IEM procedure be followed to assess any proposed future land-use.
- Prior to development, due consideration should be given to the buildings of conservation potential, as the area is located within an historical precinct.

**12. MAITLAND RESIDENTIAL AND INDUSTRIAL AREA (MRI)**

Based on the current residential, commercial and light industrial land-uses and the rezoning conditions, opportunities for development are restricted.

**Recommendations**

- The residential dwellings should be upgraded, and the commercial and light industrial services should be improved thereby providing employment opportunities.
- Any structural developments should comply with the current use zone and reZoning Scheme.
- Heavy industrial activities should be prohibited in the area.
- Public participation should be encouraged in future land-use change and development proposals.

**13. MAITLAND GARDEN VILLAGE**

There are conflicting limitations to, and opportunities for development. The existing conditionally fixed status of the residential dwellings, together with the cultural component which gives a 'sense of place', suggest that development is not suitable. The fact that the area is currently being privatised, and the use zone is to be changed to General Residential, suggests that development is suitable. In addition, there are no inherent biophysical constraints to development.

### Recommendations

- The village should be developed in order to upgrade and improve the existing homesteads, and provide needed residential units in previously undeveloped portions of land in the village.
- Prior to development, due consideration should be given to the inherent cultural element and 'sense of place' currently existing in the village.
- Public participation should be part of the development planning process.
- Should the land or part thereof, be redeveloped, sold or subdivided it is recommended that the IEM procedure be followed to assess any proposed future land-use.

#### **14. MEDICAL RESEARCH COUNCIL (MRC) LAND**

The controlling factors suggest that the area is suitable for development. There are no biophysical or historical constraints on development. In addition, based on the existing undeveloped status of the land, the General Commercial Use zone and the fact that there is an application to amend the rezoning conditions (currently being assessed by the Administrator), development could be feasible.

#### Recommendations:

- Should the rezoning conditions be approved it is recommended that the IEM procedure be followed to assess any future land-use.
- The proposed development should comply with the relatively low density character of the area.

#### **15. THE PENINSULA GOLF DRIVING RANGE**

The controlling factors suggest that the area is suitable for development. There are no biophysical or historical constraints to development. The non-fixed status of the land-use and the fact that the land is zoned for Single Dwellings Residential Use, suggest that the land is suitable for development.

**Recommendations:**

- Should the rezoning conditions be approved it is recommended that the IEM procedure be followed to assess any future land-use.
- Prior to development, due consideration should be given to the present inhabitants of Maitland Garden Village, and the cultural aspect of the village.

**16. THE CCC EASTERN LAND UNIT**

There are conflicting limitations to, and opportunities for development. There are no biophysical or historical constraints and the existing non-fixed status of the land-use encourages development. The Public Open Space Use zone and rezoning conditions impose limitations on development.

**Recommendations:**

- Should the rezoning conditions be approved it is recommended that the IEM procedure be followed to assess any future land-use.
- Should development in the area be deemed necessary, this should comply with the zoning requirements, and public participation should be incorporated in the planning stage of the development.

**17. LAND-USE POLICIES AND PLANS**

The review and assessment of the land-use policies and plans highlighted certain key factors that should be considered in future land-use planning. These have been identified:

- Prior to development, due consideration should be given to these overarching land-use policies and plans, i.e. the CMA Guide Plan, the Interim Metropolitan Development Framework (IMDF) and the C-BR study.
- Land-use planning in the CA should consider the Greening Report, which provides insight into future open space development; the WCEDF Proposed Guidelines for the Disposal of Public Land and the Peripheral Planning Initiatives.

## 18. SOCIAL ISSUES

The review and assessment of the social issues identified key metropolitan and site-specific issues that must be considered in future land-use planning in the CA.

### Recommendations:

- Future land-use planning in the CA should be proactive and adopt an integrated and holistic approach to development.
- A land-use plan should be formulated that accommodates the need for development and the need for open space, and incorporates public participation into its process.
- Environmental impact assessments should be undertaken prior to the development of any of the present development proposals e.g. the proposed Malta/Berkley Road link, river and road widening.
- Due consideration must be given to the increasing flooding problem in the area, as urbanisation and hardening of the catchments continues. The soft options for river management should also be considered;
- Should any of the land in the CA be developed for structural, aquatic, recreation or open space development, the IEM process should be followed.

## 19. CONCLUDING COMMENTS

In light of these conclusions and recommendations, the controlling factors suggest that certain land units are more viable to development than others.

According to the social concerns there is a call for a comprehensive land-use plan for the CA, that involves public participation and subsequently addresses the conflicting needs of development and conservation, and site-specific demands.

It is therefore concluded that, in areas deemed suitable, future developments or land-use changes should follow the IEM procedure (see Plan 1) and principles.

These are listed:

- Informed decision-making;
- Accountability for decisions taken and for the information on which decisions are based;
- A broad meaning of the term 'environment';
- An open participatory approach in the planning of proposals;
- Consultation with interested and affected parties;
- Due consideration of alternative options;
- An attempt to mitigate negative impacts and enhance positive aspects of proposals;
- An attempt to ensure that the social costs of development proposals be outweighed by the social benefits;
- Democratic regard for individual rights and obligations;
- Compliance with these principles during all stages of the planning, implementation and decommissioning of proposals and
- The opportunity for public and specialist input in the decision-making process.

These conclusions and recommendations highlight the underlying procedural limitation of this study.

The IEM process, principles and procedures apply to site-specific and project orientated development, whereas land-use planning constitutes a broader perspective. There are therefore, some basic limitations in applying the IEM procedure at this pre-planning stage of development.

The only readily applicable components are: issue generation through public participation, and scoping of the existing environmental factors. The former component was addressed in the baseline document. The latter component has been undertaken in this study. It is not possible to proceed to the next stage of the IEM process without specific development proposals whose potential impacts can then be assessed.

## ABBREVIATIONS

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amsl	above mean sea level
ACRC	Alexandra Care and Rehabilitation Centre
CA	CA
C-BR	Culemborg-Black River
CBD	Central Business District
CCC	Cape Town City Council
CFU	Community Facilities Use zone
CMA	Cape Metropolitan Area
CPA	Cape Provincial Administration
CPARD	Cape Provincial Administration Roads Department
CSIR	Council for Scientific and Industrial Research
EEU	Environmental Evaluation Unit
FRD	Foundation for Research Development
GB	General Business Use zone
GC	General Commercial Use zone
GR	General Residential Use zone
ha	Hectare
I&APs	Interested and Affected Parties
IEM	Integrated Environmental Management
IMDF	Interim Metropolitan Development Framework
km	Kilometre
LUPO	Land Use Planning Ordinance No. 15 of 1985

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MPhil	Masters of Philosophy
MGV	Maitland Garden Village
MOSS	Metropolitan Open Space System
MRC	Medical Research Council
MGV	Maitland Garden Village
MRI	Maitland Residential and Industrial area
POS	Public Open Space Use zone
PGDR	Peninsula Golf Driving Range
RBS	Raapenberg Bird Sanctuary
<i>pers. comm.</i>	Personal Communication
SAAO	South African Astronomical Observatory (“the observatory”)
SARCC	South African Rail Commuter Corporation
SATS	South African Transport Services
SDRU	Single Dwellings Residential Use zone
SU	Subdivisional Use zone
UCT	University of Cape Town
UDC	Urban Development Commission of the WCEDF
UU	Undetermined Use zone
VHEC	Valkenberg Hospital Eastern Campus
VHWC	Valkenberg Hospital Western Campus
VPH	Vincent Pallotti Hospital
WCEDF	Western Cape Economic Development Forum
WRSC	Western Cape Regional Services Council
yr	Year

## GLOSSARY

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*activity corridor*: a metropolitan scale linear zone or area (about 2km wide) surrounding a major high street (activity spine), containing high concentrations of transportation, land-uses and densities.

*baseline information*: the totality of all relevant information prior to the process of submitting it to critical analysis and evaluation.

*biophysical*: a category that includes both biological components (e.g. fauna and flora) and physical components (e.g. climate, hydrology and topography).

*canalisation*: the concrete lining of the banks and the bed of a river.

*channelisation*: the extension of a river by the creation of an earth channel.

*conservation*: protection from destructive influences. A term applied in general to the positive work of maintenance, enhancement and wise management, of reducing the rate of consumptions to avoid irrevocable depletion, in order to benefit prosperity, i.e. the conservation of nature or historical buildings.

*departure*: an altered land-use restriction, or a right granted on a temporary basis.

*ecosystem*: an interacting and interdependent natural system of organisms, biotic communities and their habitats.

*environment*: the biophysical and socio-economic elements.

*greenway*: a continuous system of open spaces consisting of large parks, all the way through to components such as tree lined roads which act as linking corridors.

*habitat*: area or natural environment in which the requirements of a specific animal or plant are met.

*Integrated Environmental Management (IEM)*: a philosophy that prescribes a code of practice for ensuring that environmental considerations are integrated into all stages of the development process to achieve a desirable balance between conservation and development.

*Interested and Affected Parties (I&APs)*: individuals or groups concerned with an activity and its consequences.

*inversion*: an increase of atmospheric temperature with height.

*land-use planning*: the demarcation of land for specific uses, usually (but not necessarily) over an extensive area, based on environmental, social, and economic criteria, which takes into account present and possible future needs.

*local authority*: a municipality or a division, or any other local authority established by the law.

*land tenure*: the rules and regulations governing rights of holding, disposing and using land, i.e. the conditions on which land is held varying with the social and economic organisation.

*metropolitan*: refers to the Greater Cape Town agglomeration of municipalities and other local authorities.

*Metropolitan Open Space System (MOSS)*: a linked and integrated system of open spaces within a city.

*open space*: this refers to land that has not been built on, i.e. vleis, wetlands, rivers, mountains, street verges and other undeveloped and vacant land.

*package of plans*: a five tiered hierarchical system of determining the best land-use for an area, starting from conceptual plans, and ending with specific individual site and building plans.

*planning*: a method for outlining or defining goals and ways of achieving them, or the drawing-up and implementation of a plan or land-use plan.

*public land*: land owned and administered by public bodies, from local authority level to central government.

*regional planning*: comprehensive planning, i.e. concerned with the economic, political and natural elements on a spatial basis, the area concerned ranging from Cape Town to its surrounding rural hinterland.

*regulation*: a regulation set out under LUPO No. 15 of 1985.

*register*: documents held by a local authority with all the departures concerned.

*rezoning*: the alteration of a Zoning Scheme in order to effect a change of zoning in relation to a particular piece of land.

*Smokeless Zone*: the area extending from the Groote Schuur Hospital along the N2 freeway to the Black River Parkway, along the Parkway to central Cape Town through to Camps Bay. This area has stricter air pollution standards than the rest of the city.

*South African Railway Services (SATS)*: This was the State organisation that controlled all railway services in South Africa until 1989, when the decision was taken to divide the corporation into Transnet and SARCC.

*South African Railway Commuter Corporation (SARCC)*: This came into existence in 1989, when SATS was divided, and a State corporation was established, i.e. SARCC. It controls the railway networks (lines and areas around the stations) in all South African cities (Lesley and Drapper pers. comm.).

*species diversity*: a measure of the number and relative abundance of species.

*species richness*: a measure of the number of species with no reference to relative abundance.

*state land*: this refers to the land owned by the State, and maintained by the general public.

*structure plan*: planning documents that stem from the Land Use Planning Ordinance No. 15 of 1985 (LUPO). LUPO defines the general purpose of these plans as follows: "To lay down guidelines for the future spatial development of an area in such a way as will most effectively promote the general welfare of the community concerned". Structure plans are not legally binding.

*Transnet*: Transnet came into existence in 1989, when SATS was divided. It is a private company, with the State being the largest shareholder. It controls the goods section of the former SATS property, and portions of land in-and-around railway stations in South Africa (Lesley and Drapper pers. comm.). The company administers a number of associated bodies, i.e. Propnet, Spoornet and Portnet.

*urban sprawl*: the continuous outward growth of urban areas. This results in the non-urban surroundings being slowly converted to urban areas, often resulting in the loss of important agricultural land.

*use right*: in relation to land means the right to use land in accordance with the zoning thereof, including any departure.

*Valkenberg Homestead*: also known as Valkenberg Manor House or Valkenberg Main House.

*zone*: land set apart by a control mechanism of land-use for a particular land-use, irrespective of whether it comprises one or more land units or part of a land unit.

*zoning*: a category of directions setting out the purpose for which land may be used and the land-use restrictions applicable in respect of the said category of directions, as determined by the relevant "Zoning Scheme".

*Zoning Schemes*: control mechanisms of land-use in a particular area, consisting of scheme regulations and a register with or without a zoning map.

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**Appendix 1**

**Flooding of the Liesbeeck and Black  
Rivers**

Liesbeeck Sportsgrounds



Raapenberg Bird Sanctuary and the Black River



**Appendix 2**

**Photograph of the CA in 1931**



## **Appendix 3**

# **Buildings Permitted in various Use Zones**

TABLE : BUILDINGS PERMITTED IN VARIOUS USE ZONES

Use Zone	Buildings Permitted	Buildings permitted only with the consent of Council
1	2	3
Single Dwelling Residential	Dwelling Houses	Double Dwelling Houses Places of Instruction Places of Worship
Intermediate Residential	Double Dwelling Houses Dwelling Houses	Groups of Dwelling Houses Places of Instruction Places of Worship
Grouped Dwellings Residential	Double Dwelling Houses Dwelling Houses Groups of Dwelling Houses	Places of Instruction Places of Worship
General Residential	Blocks of Flats Double Dwelling Houses Dwelling Houses Groups of Dwelling Houses Places of Worship Residential Buildings	Institutions Places of Instruction
Special Business	Blocks of Flats Business Premises Double Dwelling Houses Dwelling Houses Groups of Dwelling Houses Institutions Places of Instruction Places of Worship Residential Buildings Shops Workshops, subject to sub-section (4) below	Builder's Store Off-Course Totalisator Places of Assembly Public Garages Restaurants Service Stations

Use Zone	Buildings Permitted	Buildings permitted only with the consent of Council
1	2	3
General Business	Blocks of Flats Business Premises Double Dwelling Houses Dwelling Houses Groups of Dwelling Houses Institutions Places of Assembly Places of Instruction Places of Worship Residential Buildings Restaurants Shops Workshops, subject to sub-section (4)	Builder's Store Off-Course Totalisator Public Garages Service Stations
General Commercial	Blocks of Flats Builder's Store Business Premises Double Dwelling Houses Dwelling Houses Groups of Dwelling Houses Industrial Buildings Institutions Places of Assembly Places of Instruction Places of Worship Public Garages Residential Buildings Restaurants Shops Workshops	Off-Course Totalisator Scrap or Salvage Buildings Service Stations
General Industrial	Builder's Store Industrial Buildings Public Garages Scrap or Salvage Buildings Workshops	Blocks of Flats Business Premises Double Dwelling Houses Dwelling Houses Groups of Dwelling houses Institutions Off-Course Totalisator Places of Assembly Places of Instruction Places of Worship Residential Buildings Restaurants Special Industrial Buildings Service Stations Shops

Use Zone	Buildings Permitted	Buildings permitted only with the consent of Council
1	2	3
Noxious Industrial	Special Industrial Buildings	Business Premises Industrial Buildings Off-Course Totalisator Public Garages Service Stations Workshops
Show and Exhibition	Show and Exhibition Buildings	Any
Public Open Space	None	Any
Street Purposes	None	Any
Community Facilities	None	Community Residential Building Institutions Places of Assembly Places of Instruction Places of Worship and any building intended to be used for a purpose which is ancillary or incidental to the purpose for which any of the aforesaid buildings may be erected or used.
Undetermined	None	Double Dwelling Houses Dwelling Houses

(4) Except with the consent of the Council, no building which is or is used as a Workshop in which panel beating, sheet metal working, sand blasting, joinery, fitting of exhaust systems to motor vehicles, mechanical engineering, forging, fibreglassing, galvanising or vulcanising activities take place, shall be permitted in a Special or General Business Use Zone.

(5) Where an area is depicted on the Map as being zoned or reserved for governmental, municipal, educational, ecclesiastical or other specified purposes, such area shall be deemed to fall into a Use Zone in which buildings may, with the consent of Council, be erected and used for such purposes only.