LANDSCAPE EVALUATION OF THE LIESBEECK AND BLACK RIVER CONFLUENCE AREA: A STRATEGIC PLANNING FRAMEWORK

by

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A dissertation submitted in partial fulfilment of the degree of Master of Philosophy in Environmental Science to the Department of Geographical and Environmental Science, University of Cape Town.

1994

Executive Summary

This dissertation aims to evaluate the environmental factors within the Liesbeeck and Black River Confluence Area (CA) and on that basis present conclusions which will inform a land-use decision for the area. It has been undertaken in partial fulfilment of the academic requirements of the M. Phil (Environmental Science) course offered by the Department of Environmental and Geographical Science of the University of Cape Town (UCT). It also serves as a working document informing the Cape Town City Council's (CCC) land-use planning for the CA, and for that reason aims for a balance between academic rigour and the concise, pragmatic style of a report.

It should also be noted that this study is almost wholly contingent on a baseline document prepared between January and March 1994 by the 1993/94 M. Phil class. That document identified the totality of environmental factors which might influence land-use planning in the CA and is the point of departure of this dissertation.

The CA is located approximately 5.5 km east of the Cape Town Central Business District at the point where the more fertile lowest slopes of Devil's Peak meet the sandy soils of the Cape Flats. Measuring 232 ha in extent, the CA is bounded by Liesbeeck Parkway in the west, the N2 in the south, Alexandra Road in the east and by Berkley Road and the Culemborg-Black River (C-BR) marshalling yards in the north. The Liesbeeck and Black Rivers run through the area, meeting in the extreme north.

Most of the CA is relatively underdeveloped and comprises open space and there are indications that the area is of some conservation significance. At the same time the CCC has recognised that urban sprawl needs to be contained and higher density living promoted. Together with increasing development pressures and the public awareness generated by the adjacent C-BR study (examining the disposal of Transnet land), these factors have combined to make planning of the sustainable and most appropriate land-use in the CA vital.

Though this is primarily an environmental evaluation exercise, this study must, by virtue of the fact that it informs a land-use planning decision, stray into urban planning territory. For that reason a not inconsiderable proportion of this study is devoted to providing a better understanding of the ideological motives behind, and functions of planning. Planning is a normatively laden exercise entailing a degree of advocacy, an observation which has led this dissertation to be fairly bold in the pursuit of what could be realistically accomplished in the CA (not the same thing as what should happen). Furthermore, with a fuller understanding of planning it became evident that a high-resolution examination of the CA would be inadvisable and as a result the conclusions are pitched at a level commensurate with the second-tier development framework of the package of plans approach. To this end the distinction in this landscape evaluation is simply between development and no-development and not, for example, between residential, commercial and other uses.

Upon careful reconsideration of the factors concerned, this study concurred with the preliminary assessments conducted in the baseline document and concentrated on those environmental controlling factors pinpointed in that report. In broad terms the environmental factors are of two types: mappable geographic features of the biophysical, built and institutional/administrative environment; and more qualitative issues and/or concerns, many of them raised by Interested and Affected Parties (I&APs) consulted during the baseline study.

Numerous methods have been devised for the assessment of environmental impacts and these were investigated with a view to employing them in this dissertation. However, most of these were unsuitable, primarily because of their focus on development impacts (whereas this study is concerned with an examination of environmental factors) and also because they cannot satisfactorily accommodate both quantifiable and qualitative factors. Upon evaluation it was decided to treat these two factor groupings separately.

The quantifiable factors were further split into two categories, *viz.* primary and secondary. The key features of the secondary factors are that they constitute constraints which can be mitigated and that - as revealed by an unpublished pilot study - they are only problematic in areas where they are overridden by one of the primary factors, usually flooding. The secondary factors are of a physical (e.g. climate, geology), biological (e.g. wetlands and their associated birdlife) and

infrastructural nature.

Because land-use planning is a spatial exercise, it became apparent that some form of mapping technique would be most appropriate for the evaluation of the primary factors. Three primary factors were identified, partially on the basis of their physical (i.e. flooding), cultural (i.e. historical) or 'socio-spatial' (i.e. land-use/landownership) nature, and mapped. A form of customised McHarg overlays, which have the added advantage that they are premised on an ecological approach which allows the (physical) environment to determine development sites, was selected. The McHarg method is essentially a land suitability exercise which aims to determine the optimal location for previously decided land-uses, in this case simply development or no-development.

The crux of this method is the formulation of criteria so that the CA can be rated in the following manner, per primary factor:

- Very Favourable (A)
- Favourable (B)
- Unfavourable (C)
- Very Unfavourable (D)

The ratings are expressed in terms of development (although in the dissertation itself the more confusing concept of no new development, but altered land-use, is also incorporated into the ratings).

Different criteria apply to each of the primary factors and, in brief, they are as follows:

- Flooding: floodlines.
- Historical: age, rarity and condition and design quality of a structure.
- Land-Use/Landownership: utilisation, obsolescence, size of landholding, landownership and location.

The final product is a composite overlay, incorporating all three factors, which demarcates development and no-development areas within the CA.

The qualitative factors have the effect of moderating the vigour with which the quantitative factors are able to dictate a land-use decision for the CA. There are a number of factors which need to be considered and rather than list them individually, the major implications arising from them are proffered in summarised form: policy directives indicate that open space in the Cape Town Metropolitan Area should be highly valued, especially that within the CA; the probable C-BR developments will relieve development pressure on all adjacent land and an interim moratorium on development within the CA becomes plausible; efforts must be made to afford improved access to the CA; current zoning might be open to revision and is not as much of a constraint on future development as it seems; and the I&APs' concerns need to be accommodated during the planning procedure and one of the best ways of achieving this is through adopting a system of transparent and accountable decision-making, predicated on the Integrated Environmental Management philosophy.

The conclusions flow from an amalgam of the quantitative and qualitative factors and, in a spatial sense, are encapsulated in the accompanying map which designates development and no-development areas. Before listing these areas against their composite rating below, it should be reiterated that this map indicates those areas which *could* readily be developed (and is fairly contentious in identifying institutions like Valkenberg Hospital and the South African Astronomical Observatory [SAAO] thus) and does not insist that they *should* be developed.

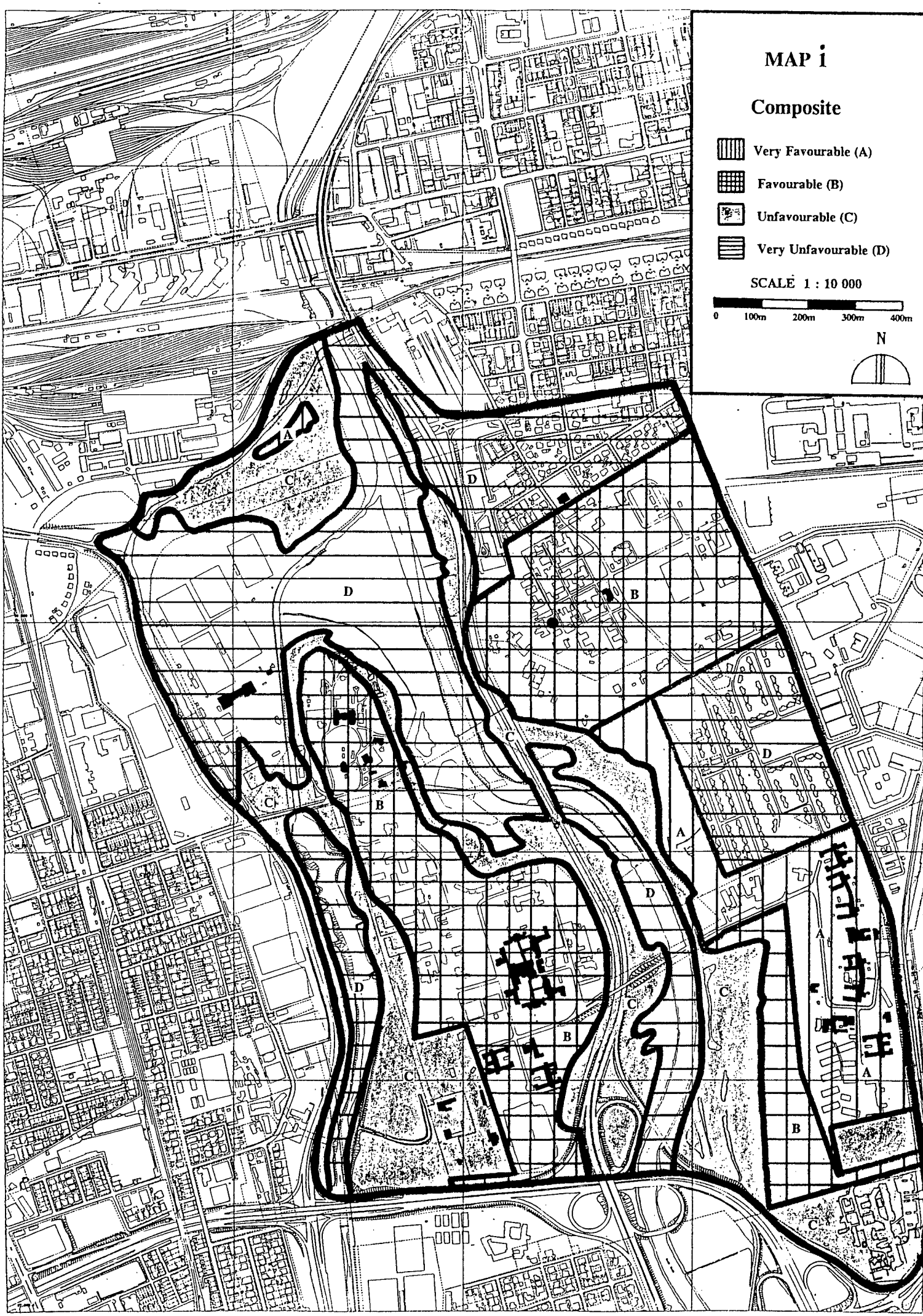
Favourable or Very Favourable

- Peninsula Golf Driving Range.
- Valkenberg eastern campus.
- The strip of land between the Pallotti wetland and the Valkenberg eastern campus.
- Those parts of the SAAO, Alexandra Care and Rehabilitation Centre and Valkenberg western campus lying above the 50 year floodlines.

Unfavourable or Very Unfavourable

- All areas below the 50 year floodlines (best given over to open space).
- Liesbeeck Sportsgrounds (the undeveloped parts of which are probably best retained as open space).
- UCT Courtyard- and Gateway Park- developments (once current schemes are completed).
- Vincent Pallotti Hospital (left in present state).
- Berkley Village and Maitland Garden Village (left largely intact, though allowing for possible upgrading).

A series of recommendations and guidelines are appended to the conclusions. The most important of these calls for the adoption of the conclusions by the CCC, who should proceed with the land-use planning exercise, but declare a short-term moratorium on further development in the CA. Furthermore, the CCC should take cognisance of the current 'green' approach to urban planning and in this regard, should not be afraid of allowing this progressive stance to influence the final land-use decision.


MAP i
Composite
Very Favourable (A)
Favourable (B)
Unfavourable (C)
Very Unfavourable (D)
SCALE 1 : 10 000
0 100m 200m 300m 400m
N

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Acknowledgements

Many people and groups contributed towards this dissertation, and particularly towards the compilation of the baseline document, and to them I would like to extend my sincerest thanks. Worthy of a special mention are the rest of the study team (see Appendix 1) and Belinda Dodson, my supervisor from Woodstock.

The financial assistance of the Centre for Science Development (HSRC, South Africa) towards this research is hereby acknowledged. Opinions expressed and conclusions arrived at, are those of the author and are not necessarily to be attributed to the Centre for Science Development.

CHAPTER 1

Introduction

1.1 Background

At a time when development pressure and the demand for land is mounting, the authorities, particularly within the Cape Town City Council (CCC), have recognised that urban sprawl in Greater Cape Town cannot be allowed to proceed unchecked. In this light it is critical that informed land-use planning decisions, which accommodate both development pressures and countervailing environmental considerations, are taken.

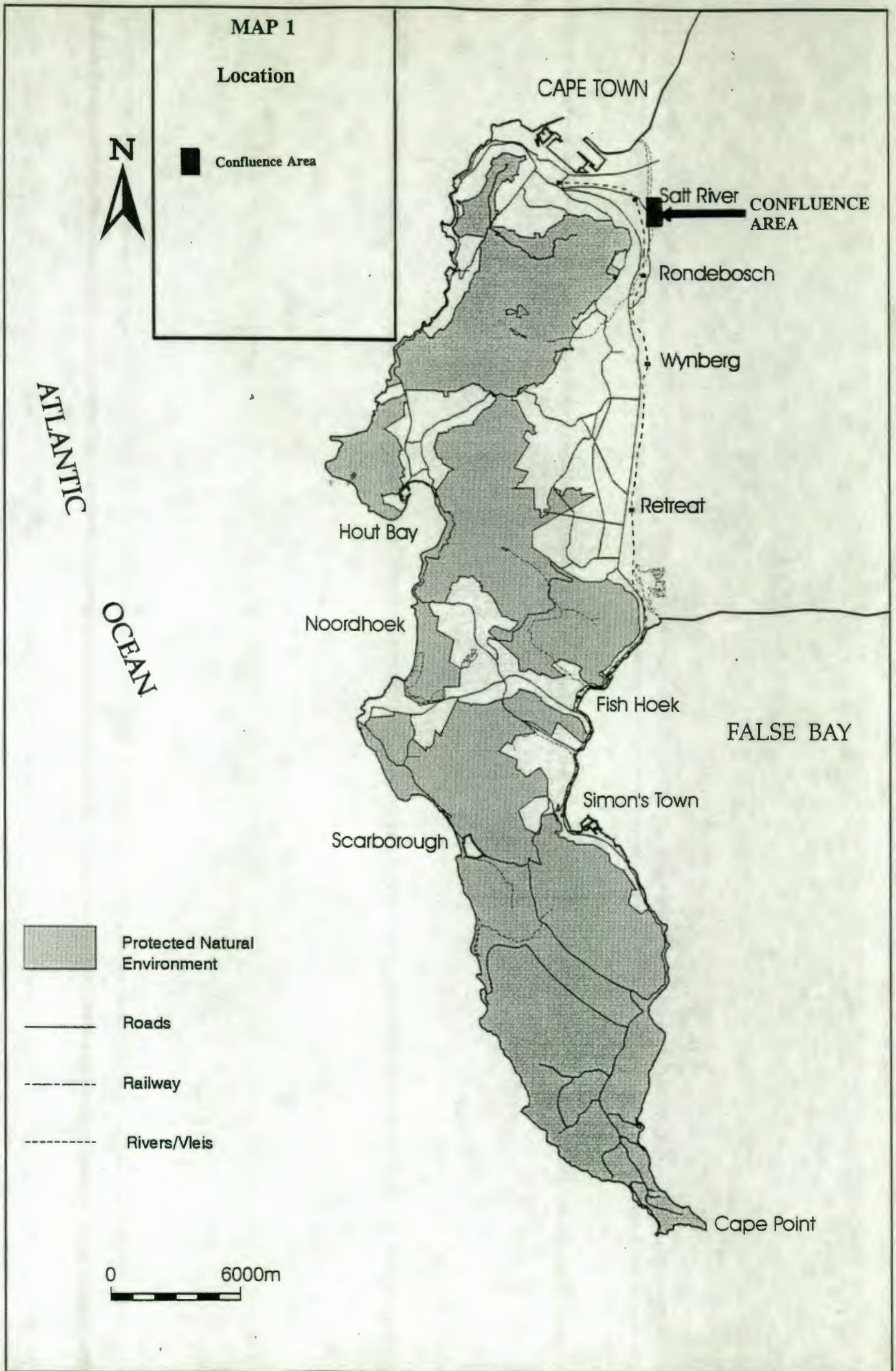
The pressure for development of open land close to the Central Business District (CBD) is even more intense and here the optimal land-use planning decision becomes that much more crucial. An example of such land is the area immediately south of the confluence of the Liesbeeck and Black Rivers, hereafter referred to as the Confluence Area (CA). (See Map 1 for the precise location.)

The CCC is undertaking a planning exercise in an attempt to ascertain the most appropriate land-uses for the CA. A number of studies, some of them completed, will inform this planning exercise. While this dissertation is primarily intended to fulfil the academic requirements of the M. Phil (Environmental and Geographical Science) programme, it is also designed to assist the CCC in their planning exercise.

For the first three months of 1994 the M. Phil students in the Department of Environmental and Geographical Science pooled their resources and worked together on the compilation of a baseline document, in which the environmental factors which might in some way be of significance in a land-use decision for the CA were set out. The process of data collection and rudimentary assessment was guided by the principles of Integrated Environmental Management (IEM) and to that end a holistic approach, encompassing both the natural and human environment and incorporating both public opinion and expert judgment and which allows for

transparent and accountable decision-making, was adopted (Department of Environment Affairs, 1992).

During April, May and June of 1994, each of the M. Phil students prepared an individual dissertation comprising an evaluation of the primarily descriptive data presented in the baseline document, and presented in a format appropriate for informing land-use decision-making. This document is one such dissertation; clearly, it is contingent on the baseline study which preceded it, but it should, nevertheless, be viewed as a stand-alone report.


MAP 1
Location
Confluence Area
N
CAPE TOWN
Salt River
CONFLUENCE AREA
Rondebosch
Wynberg
Retreat
Hout Bay
Noordhoek
Fish Hoek
FALSE BAY
Simon's Town
Scarborough
Cape Point
ATLANTIC OCEAN
Protected Natural Environment
Roads
Railway
Rivers/Vleis
0
6000m

1.2 Aims of the Study

The primary aim of this dissertation is to provide a basis for land-use planning in the CA by designating areas suitable for (re)development and areas of non-development /open space. (Development, in this dissertation, means a change in land-use, invariably requiring the construction of built structures, but see section 4.5.1). To that end this dissertation must:

- synthesise and evaluate the data gathered in the baseline document;
- propose and employ a method of landscape evaluation, requiring (at the very least) a rating of environmental factors, in order to make the distinction between (re)development and non-development areas possible;
- identify and assess other minor environmental factors which, while they might not present major opportunities or constraints, will nevertheless need to be addressed;
- make recommendations and suggest guidelines for the future planning of the CA so that this might incorporate environmental considerations *ab initio*.

In addition this report should:

- assess and incorporate the views of Interested and Affected Parties (I&APs), both where unanimity was reached (which might serve as a call to action) and where points of conflict arose (where objective analysis might serve to alleviate conflict);
- evaluate and be led by the significance of contextual factors, which often cannot be meaningfully examined using conventional, quantitative landscape evaluation techniques;
- be academically rigorous and make reference to the theoretical underpinnings of the various approaches and methods employed.

1.3 Approach and Methods

The broad principles of IEM have guided the methods utilised in the compilation of this dissertation. IEM is designed to ensure that environmental considerations (in the broadest definition) are taken into account in all development proposals (Department of Environment Affairs, 1992). It is primarily an environmental management system concerned with procedures, and places great emphasis on public participation and transparent, accountable decision-making. Another crucial aspect is the timing of environmental input/assessment; to be meaningful it should occur at the proposal or design stage and in this respect this study is well-positioned. In preparing this dissertation, the difficulty of determining the appropriate boundary between the activities of the various professions and procedures involved in planning became apparent. An environmental professional, in aiming to be holistic in approach, inevitably transgresses some of the conventionally-accepted professional and disciplinary boundaries. Although an attempt is made here to limit unnecessary transgression, this dissertation nevertheless ventures into some 'urban planning' terrain.

Within this general framework, the choice of method was constrained by two primary factors.

The first was the form and level of detail of information presented in the baseline document, which because of time and cost limitations, did not consistently provide high-resolution technical baseline data. This has precluded an excessively technical mode of evaluation in this study.

Secondly, while there are a number of methods available for Environmental Impact Assessment (EIA) when, by definition, project actions (e.g. development proposals) are known in advance, not all of these methods are applicable, nor even appropriate, in a pre-planning landscape evaluation exercise. This has meant that the method employed has had to be customised to suit the forward planning nature of this study.

The methods employed in this dissertation were fairly straightforward:

- The relevant literature was consulted to provide a theoretical appreciation of the planning function as a whole and, more particularly, as the basis for the land evaluation method which

was used. With a better understanding of the theory, the evaluation proper becomes far more meaningful.

- In order to take account of South African and CA conditions, the input of a limited number of environmental and planning experts was sought so as to supplement the theory and to suggest alterations or methodological improvements which would make it more appropriate or relevant to the local context.

- A customised McHarg overlay technique was developed and used to identify those parcels of land more suited to some form of development (McHarg, 1969). This is essentially an ecological approach, whereby the land as it currently 'presents' itself (i.e. including the built environment) determines the appropriate land-use. The final output of this analysis is a composite map of geographic controlling factors.

- The composite map formed the building block around which an analysis of moderating qualitative factors (e.g. accessibility, policies, I&APs' concerns) was undertaken. Together the composite map and these factors were used in formulating the conclusions, expressed in terms of development and no-development zones.

- Recommendations, most of which are formulated as specific, pro-active planning and management proposals, and guidelines, which address more generic constraints *apropos* possible, future development, are then proposed, qualifying the main conclusions of this study.

Although the evaluative component is critical for the derivation of the development and no-development areas, this report focuses more on theory, especially planning theory and the socio-economic forces shaping urban spatial configuration, than might be expected. The terms of reference, as set out in the baseline report, make it clear that this study is not a fully fledged planning exercise and that the focus should be on the synthesis and evaluation of environmental factors, yet in considering prospective land-uses one inevitably enters into the planning domain. It therefore became essential to have a better appreciation of the planning process and what planners can realistically be expected to accomplish, given that urban development is a dynamic process driven by larger socio-economic forces which might dictate a different urban landscape.

Also, it will become apparent that planning is a normatively laden process and that planning, if not explicitly, is implicitly subjective in nature. Inasmuch as this study is a planning exercise, it adopts a relatively explicit subjective tone and constitutes a form of advocacy planning. Without this element of advocacy, planning 'risks being rigorous but useless, analytically precise but off-target' (Krumholz & Forester, 1990, p 106). The approach in this study has been to pursue some fairly radical planning options, particularly as regards the status of major institutions within the CA.

In response to the frequent accusation that EIAs and IEM are time-consuming and expensive processes, the evaluative methodological component of this report is purposefully curtailed. There must be some trade-off between comprehensiveness and usefulness in all EIAs and this report has been shaped by the belief that a competent and timeous report is preferable to an excessively comprehensive report which delays (development) planning.

1.4 Assumptions and Limitations

This report assumes that:

- the information presented in the baseline document, and which crucially informs this dissertation, is accurate.

The limitations encountered in preparing this dissertation were that:

- Time constraints precluded a participatory approach in the rating and ranking of the environmental factors (although I&APs were extensively consulted in the formulation of the baseline report). As a consequence, panel evaluation methods, for example, were not feasible (Stauth, 1993).

- Where omissions in the primary data were identified, time constraints precluded the generation of additional data.

- Financial constraints meant that very few commercial experts or professionals could be consulted.

- The recommendations of the adjacent C-BR study, commissioned by the CCC with the aim of managing the disposal of State (Transnet) land in the area, will probably have major implications for the CA, yet this CA analysis had to proceed without a full awareness of what those recommendations might be.

1.5 Report Structure

This report comprises seven chapters, the first of which contains introductory and procedural information. By its very nature the entire dissertation has to attempt a fine balancing act. On the one hand, this report is intended as an advisory document and as such a simple analytical and presentational format, highlighting key decision-making factors, is warranted. On the other hand, it is an academic exercise which has to meet certain scholarly standards and norms, particularly as far as an understanding of the relevant theory and its practical application is concerned.

Chapter 2 commences with a brief description of the CA and then proceeds to highlight those environmental factors, as identified in the baseline study, which need to be evaluated to inform land-use decision-making in the CA. This is followed by a discussion of some general points which, while they will not directly influence land-use planning, afford a better understanding of the context within which the final land-use decision will be made.

In chapter 3, planning itself, identified as a key factor, is the focus. The ideological underpinnings and functions of (urban) planning are highlighted, together with the sometimes problematic relationship between planning and environmental management.

Chapter 4 comprises a pre-evaluation discussion. A synopsis of the many land evaluation methods available is presented, with particular emphasis on McHarg-type overlays, the method which, upon critical evaluation, was selected as the most suited to this exercise. There is also a brief discussion of land-use capability and land-use suitability, which introduces the landscape

evaluation, the main thrust of the next chapter.

Chapter 5 comprises the landscape evaluation *per se*. It outlines how the different environmental factors will be treated, as determined, for the most part, by their 'mappability'. The factors are distinguished as either secondary or primary. There is a fairly extensive investigation of the criteria formulated for the internal rating of each of the primary factors (especially those pertaining to current land-use and landownership) in terms of their significance as constraints to development. The final product of this chapter is a composite overlay map, which suggests which parcels of land might be suitable for (re)development and which are not.

Chapter 6 points out that this map is not the 'solution' to the land-use puzzle; many concerns of a socio-political nature still need to be addressed (e.g. the decision-making procedure, the development versus open space debate, and the likely influence of the C-BR development). These, alongside other I&APs' concerns, form the nucleus of this chapter's discussion.

Finally, chapter 7 comprises the conclusions, recommendations and guidelines. The former are primarily a summarised re-statement of the key points from the preceding two chapters, while the recommendations are a little more adventurous and include a more normative element based on subjective judgment. The guidelines are less pro-active in character and indicate certain measures which should be considered in response to development proposals.

CHAPTER 2

Description and General Discussion

2.1 Introduction

Chapter 2 is mainly descriptive in nature and commences with a brief non-evaluative depiction of the CA. Thereafter it lists the environmental controlling factors, drawn from the array of factors examined in the baseline document, which will inform this study. There are, however, a set of issues which need to be understood before proceeding with the formal evaluation. These are of a general nature and constitute the last section of this chapter.

2.2 Confluence Area Description

The Confluence Area is located only 5.5 km east of the Cape Town CBD at the point where the steeper slopes of Devil's Peak meet the Cape Flats. Measuring 232 ha in extent, the CA is bounded by Liesbeeck Parkway in the west, the N2 in the south, Alexandra Road in the east and by Berkley Road and the Culemborg - Black River (C-BR) marshalling yards in the north. The Black River Parkway bisects the site, while the Liesbeeck and Black Rivers run through the area, meeting in the extreme north.

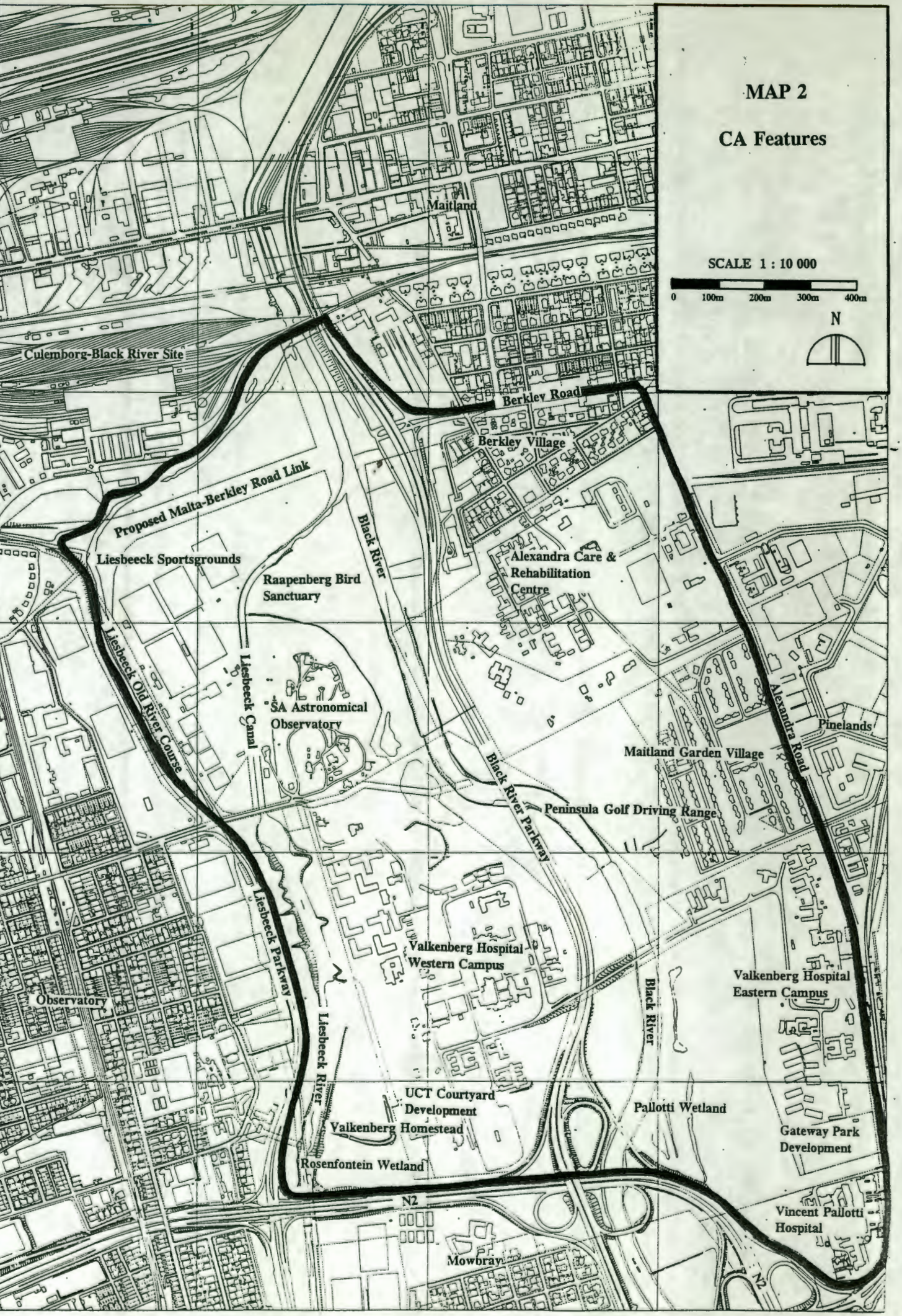
The areas adjacent to these two rivers are open space and contain a number of mostly seasonal wetlands, one of which falls within the Raapenberg Bird Sanctuary (RBS). These are important stop-over points for some bird species. In terms of its geology, the site comprises mainly transported alluvial soils in the Black River floodplain and stable Malmesbury Shales in the rest of the area. Geomorphological processes and forms in the study area do not appear to be in any way exceptional or noteworthy. Similarly, the micro-climate is not characterised by any processes which make it very different from that which affects the entire Cape Metropolitan Area (CMA).

The study area is relatively underdeveloped and much of the land is given over to institutional

use. Thus, the Valkenberg and Vincent Pallotti Hospitals, the Alexandra Care and Rehabilitation Centre (ACARC) and the South African Astronomical Observatory (SAAO) are important institutional land-uses. The CCC also owns a significant holding, mainly alongside the rivers' banks, while Transnet owns and leases out the Liesbeeck Sportsgrounds. There are two residential complexes in the eastern sector of the CA, i.e. Maitland Garden Village and the residential area immediately south of Berkley Road, hereafter referred to as 'Berkley Village'. There is also some limited commercial activity in the vicinity of Berkley Village.

The area has been inhabited for thousands of years and it is presumed that there are numerous yet-to-be examined archaeological sites. It is also the site of the first permanent free burgher settlements in South Africa, though no relics from this era remain. Nevertheless, there are buildings of recognised historical value in the CA, including the Valkenberg Homestead, the Nieuwe Molen, the SAAO and the Valkenberg Hospital administrative block.

The development status of the CA has remained largely unchanged for the last 25 years, not least because there are a number of historical sites in the area. However, the UCT Courtyard development, centred on the historic Valkenberg Homestead, is underway and the Gateway Park development is expected to commence shortly. The former will be managed by the developer and is expected to provide executive accommodation for the next 20 years at which time it reverts to UCT, while the Gateway Park development will offer conventional office space and undercover parking. Map 2 depicts the key features of the CA, many of which are described above. (For a detailed description of the CA, see the baseline report [Engeo, 1994], especially chapter 1.)


MAP 2
CA Features
SCALE 1 : 10 000
0 100m 200m 300m 400m
N
Maitland
Culemborg-Black River Site
Berkley Road
Berkley Village
Proposed Malta-Berkley Road Link
Black River
Liesbeeck Sportsgrounds
Raapenberg Bird Sanctuary
Alexandra Care & Rehabilitation Centre
Liesbeeck Old River Course
Liesbeeck Canal
SA Astronomical Observatory
Alexandra Road
Pinelands
Maitland Garden Village
Black River Parkway
Peninsula Golf Driving Range
Liesbeeck Parkway
Valkenberg Hospital Western Campus
Valkenberg Hospital Eastern Campus
Observatory
Black River
Liesbeeck River
UCT Courtyard Development
Valkenberg Homestead
Pallotti Wetland
Gateway Park Development
Rosenfontein Wetland
N2
Vincent Pallotti Hospital
Mowbray

2.3 Key Environmental Factors

The baseline study identified the following environmental controlling factors as likely to be influential in a landscape evaluation assignment:

- the susceptibility of parts of the CA to flooding;
- a number of ecologically sensitive wetlands which serve as important stop-over points for some migrant bird species;
- some minor infrastructural limitations in the form of service conduits running along the eastern edge of the Black River Parkway. (The transport infrastructure, especially the major roads, is assumed to be a 'fixed' constraint.);
- historical and presumed archaeological sites;
- current land-use;
- present landownership;
- metropolitan land-use policies and plans, which recognise the conflicting pressures for development and open space/greenbelts;
- the C-BR development, abutting the northwest corner of the CA.

Consultation with I&APs who were admittedly guided by the study team to some extent, revealed that, with the exception of the last point, they too were concerned about precisely these factors. In addition, they raised a number of procedural and managerial concerns and these are listed below:

- the need for the integrated management of the Black and Liesbeeck Rivers;
- public participation in land-use decisions as a prerequisite;
- clarification of the process for the privatisation of State land;
- the need for effective planning in reaching a the land-use decision.

These environmental controlling factors and procedural concerns cover virtually all the points raised in the baseline study, where they were the subject of a preliminary assessment. Upon careful reassessment of all the factors, it was agreed for the purposes of this dissertation, that these were indeed the most significant factors and the ones that would be thoroughly evaluated

in this study. They are dealt with in some detail throughout the report.

2.4 General Discussion

This section focuses on a number of factors which are likely, in a contextual sense, to influence and inform a land-use decision in the study area. These factors were identified through various means: some revealed themselves after even the briefest of visits to the study site; others have been suggested by I&APs; others are drawn from the relevant theory; and yet others were unearthed in the process of researching this dissertation. While they do not lend themselves to quantitative assessment, they are nevertheless key influences which will serve to confirm or moderate the more rigorous scientific evaluation which follows in chapter 5. (In a similar way, chapter 6 concerns itself with non-quantifiable information, but it is of a more site-specific nature and more directly informs land-use decision-making.)

2.4.1 The Confluence Area and its Urban Function

The CA separates the commercial core of the city from the residential areas to the south. It is an area of mixed land-use - increasingly so as new developments are approved - and in some parts (e.g. Liesbeeck Sportsgrounds, Valkenberg eastern campus) is tending towards deterioration and blight. In many ways it fits Carter's (1981, p 231) description of a Zone in Transition, one 'locationally separating the retail heart of the city from surrounding residential neighbourhoods'. And in a South African context, it would be reasonable to speculate that the CA abetted apartheid planning, in that it comprised a buffer strip aimed at ensuring spatial segregation between residential areas for different race groups. The presence of institutions commonly eliciting a NIMBY (Not In My Back Yard) response is more explicable in this context.

The rate of change of land-use in the CA has clearly been limited by the State's ownership of a large proportion of the land, which it has retained in the face of economic exigencies. This is lucidly illustrated by the adjacent C-BR study, where the imminent release of strategic quasi-State land can be expected to produce radically different land-uses. Allowing this sort of flexibility for the more efficient accumulation of capital is imperative for the long term survival of cities. Although changing land-use represents a challenge for planners, it is in fact a sign of

vitality in cities and it is those areas not experiencing change that are the real problem and which are more likely to fall into decay (Carter, 1981).

The CA is also interesting in that it is in effect a 'transect' from obsolete transport/warehousing and other inner city uses, to standard suburban use. At the inner city end of this transect, ground rents are likely to have fallen to such an extent that the land no longer offers a profitable financial return. One of the few ways of raising profits is by cutting back on building maintenance, resulting in urban decay. Nearer the suburbs, returns will be high enough to satisfy capital. Somewhere in the middle of this transect are tracts of land where the rent gap between actual capitalised ground rent and potential rent, given a more appropriate land-use, is becoming sufficiently large so that redevelopment becomes a profitable option (Smith, 1984).

Together these factors indicate that, in terms of its location and with the changeover to the post-apartheid city, the CA is an economically stifled Zone in Transition and that there are good economic and social reasons for proposing far-reaching land-use changes.

2.4.2 Open Space

The CA is a relatively underdeveloped area and as much as half of the site's 232 ha is open space in one form or another. It is clear that decisions relating to open space will be crucial in the CA, so a better understanding of open spaces and their functions is important.

Although there is an incessant demand for developable land, there is a common perception, expressed too by the majority of the I&APs in the baseline study, that open space in urban areas is beneficial and should be retained wherever possible. Open space presents itself in many forms in the urban environment, ranging from pristine vegetation to manicured 'European' parklands to recreational facilities such as sportsfields and racecourses.

However, derelict and vacant land also constitutes open space, albeit in a form viewed with general disfavour. There are many explanations for the causes of dereliction. Part of the problem is 'frictional', i.e. the unavoidable dereliction arising as land-use evolves (Couch, 1990). But for the most part, there are structural economic reasons for urban dereliction and vacancy, often exacerbated by the speculative ownership of land by State agencies. Derelict

urban areas are the focus of most urban renewal programmes, a state of affairs mirrored by current concern for the future of the CA.

Nevertheless, the positive popular perception of open space remains intact. Often-cited reasons for the preservation of open space in South African cities are (Boddington & Wall, 1988):

- to maintain ecological life support systems;
- to ensure certain levels of human psychological wellbeing;
- to cater for recreation needs, both active and passive;
- for aesthetic reasons;
- to cater for educational needs; and
- for planning and financially-related reasons, e.g. as a buffer strip between conflicting land-uses.

These are all good reasons for valuing open space, yet they do not give an indication of how important open space is relative to other spatial demands. Although it has been proposed that 1.5 - 2.0 ha of open space should be provided per 1000 urban dwellers, ultimately it makes more sense to have open space standards which are at least partially determined by location (Council for the Environment, 1988). Other Council for the Environment (1988) guidelines are more helpful, specifically one which prioritises the conservation of streams and wetlands and another proposing that local authorities should aim to avoid duplication of recreational facilities. In this regard, two golf driving ranges in the CA seems misguided. (For further comment on the nature and availability of open space in Greater Cape Town, see section 6.2.)

Open space, therefore, is a highly valued 'commodity' and there is general acceptance that efforts should be made to retain it. In urban environments the need to do so is even more pronounced, though it should also be conceded that at times open space can be a blight on the landscape and that there will be occasions when a different form of land-use might be appropriate. To achieve a balance between open space and development is the challenge posed by the CA.

2.4.3 Floodplains

Almost 40% (104 ha) of the CA, most of it open space, lies within the 50 year floodlines for the Liesbeeck and Black Rivers and the threat of flooding is likely to limit development options in the future. Already, parts of the Liesbeeck Sportsgrounds and the SAAO are either flooded by river overspill or inundated by impeded runoff/infiltration on an annual basis. The baseline document indicates that flooding will become even more of a problem as hardening of the catchment proceeds, and highlights the public concern about proposals to canalise and channelise the Black River. In addition, the threat of increased flooding following from global warming and a concomitant rise in sea level might also serve to accentuate the risks of development in floodplains. Floodplains are natural stormwater conveyers and it has been suggested that, in addition to being made accessible to the general public as open space, they should also be preserved as much as possible, although a balance with overall land-use plans must be maintained (Corin, 1991).

Another recent development, analogous to the current disfavour with which inflexible zoning is viewed, is the re-assessment of floodlines as valid planning constructs. An engineering capability driven approach which examines the interaction between floodwaters and development is emerging, one which identifies low hazard or high hazard land-uses and which expressly views flood prone areas in three categories, viz. floodways, flood storage and flood fringe (Corin, 1991). As might be expected, high hazard developments will incur the greatest financial expense.

Clearly, the threat of flooding will be a major constraint on land-use options within the CA, and it is investigated in further detail in sec 5.4.1.

2.4.4 Minor Contextual Issues

Before proceeding to further theoretical discussion and the evaluation *per se*, some discussion is warranted on a number of other issues relating to the site and which will influence land-use decisions and the method of landscape evaluation. Many of these points coincide with the opinions of the I&APs and, indeed, some are derived from that source. Each is only briefly discussed below, as they are fairly general points which are either not particularly contentious

or have consequences which can simply be taken as given and do not demand detailed analysis.

- Some concerns are very important, but are not ones which can be meaningfully directed at the CA. Job creation and housing are the best examples. They will have to be addressed at a national level and although central and regional government pronouncements in this regard might well affect the CA, it is difficult and inadvisable to incorporate these variables, other than in the most general sense, as potential determinants of land-use.

- The CA is very strategically located and is surrounded by some of the most important transport routes into the city. Furthermore, many of the major centres of employment in the Cape Town Metropolitan Area (CMA) are in the immediate vicinity of the CA. These considerations make it very likely that a planning compromise between open space and development zones in the study site will have to be reached.

- The divided nature of the study area needs to be emphasised. The Black River and Black River Parkway bisect the CA and together constitute a major barrier to east-west movement and, in effect, it is quite plausible to view the site as comprising two functional units. Nevertheless, this divisive corridor, and especially the Black River, must be seen as part of an integrated ecological system and land-use recommendations and management regimes should take cognisance of that. (See section 6.4 for further discussion of this problem.)

- Though it will become apparent later, it should be reiterated that the CA is a historically sensitive site, most notably in regard to its post-1652 significance. In many ways it could be argued that the CA, especially those areas nearer the Liesbeeck River, is of more historical significance than the limited number of remaining historical buildings suggests.

- There is a considerable proportion of open space in the CA, much of it located within the boundaries of major institutions. Yet access to this land is restricted and there is some debate as to the location of these institutions, with many I&APs viewing them as Locally Unwanted Land-Uses (LULUS).

- Finally, it should also be remembered that land-use decisions and the developments arising

from them, have the capacity to set precedents, both good and bad. It is critical that the best land-use decision is taken, one which might require adventurous decisions which, for example, might provide for an invigorating admixture of private and public uses.

CHAPTER 3

Planning

3.1 Introduction

The terms of reference for this study make it clear that to some extent the landscape evaluation, which is the nucleus of this study, cannot be adequately performed without a proper understanding of urban planning if sensible land-use options are to be presented. Indeed, an understanding of planning theory and practice is essential for an awareness of what types of land-use might be feasible in the CA. Furthermore, the I&APs made it clear that competent planning is one of the principal ways of ensuring that the best land-use decision for the CA is taken. To that end, this chapter discusses planning ideology - an abstract set of planning objectives - before examining the functions of planning and an approach to planning which will best provide a framework for the landscape evaluation *per se*. Lastly, there is a discussion of urban planning and IEM, and the sometimes conflicting demands of these two professions, their methodologies and discourses.

3.2 Planning Ideologies

There are many sets of conflicting theories which aim to explain the development and function of cities. Some of these view the city as a historical process or as an ecosystem of human groups, but the most meaningful conception is of the city as a space for the production and distribution of material goods (Lynch, 1981). This hypothesis makes economic efficiency the key determinant of spatial urban form and configuration and, for example, is the theoretical foundation of 'central place'-type theories.

In a more abstract sense planning is about power (e.g. the mere ownership or occupation of land confers great economic power). The regulation of this power is, ultimately, what planning sets out to achieve. Regulation is directed at three major landowning groups, *viz* institutions (usually financial); the public sector; and private individuals (Kivell, 1993). This combination of power

and the statutory right to regulate can make planners formidable political actors (with agenda of their own); a perhaps jaundiced view is that planners know what they think is best and that 'planning practice has been distilled to an exercise in the mechanics of persuasion' (Hillier, 1992, p. 5).

Land is not only the tangible embodiment of power; it is also represented in structural spatial patterns, which are the determinants of urban morphology. And as Kivell (1993) has noted, land as urban morphology and land as power come together to form a large part of the basis of town planning. This observation can be extended even further if one recognises that for the most part town planning is synonymous with land-use planning. Land-use planning and planners are fundamentally interested in control, in many respects also an assertion of bureaucratic power. Foucault (1984) has succinctly captured the essence of planning and his central contention is that the city, its built form and the practices of those who sculpt that form are largely concerned with imposing control over individuals.

There are three groups of actors in the planning system, namely a professional bureaucracy, politicians, and pressure groups in the middle. It is an inherently political system and the two former groups spend much of their time trying to placate the pressure groups (Kivell, 1993). Planners, therefore, have to tread a fine line in the attempt to balance an uneven distribution of power and to protect the interests of weaker groups. This 'Robin Hood' view of planning taking from the rich and giving to the poor amounts to straightforward interference in the market mechanism. More recently, however, there are signs that this approach has been reversed as planners focus on pro-development policies aimed at urban renewal, which explains schemes such as the Docklands development in London and, quite plausibly, the C-BR study in Cape Town.

Another aspect worthy of illumination is planning's basically negative role. Planners can prevent or modify proposed developments, but they cannot force developers or landowners to undertake a particular scheme. This right of veto, nevertheless, has very visible consequences and translates into a spatial pattern of land-use control, aimed at the regulation of the urban environment for the efficient functioning of the social and economic system.

The urban environment, therefore, is a particular spatial configuration for production, social reproduction, consumption and exchange. Given an economic system - usually capitalism - the city exists because it makes certain economic functions more efficient. The basic building block of each economic unit in urban space is the 'individual absolute space of private property' and this indicates that land-use planning is crucial for the smooth economic functioning of cities (Smith, 1984). This is no easy task. Planning must attempt to reconcile two of the State's contradictory functions: to create the favourable conditions for capital accumulation and social reproduction; and to ensure the perpetuation of these conditions through the promotion of equity and social harmony (Kivell, 1993). That a land-use planning exercise for the CA is underway suggests that the CCC has recognised the economically (and, perhaps, socially) inefficient manner in which this area is being utilised. Perhaps the current land-uses are inappropriate?

Indeed, Harvey (1985, p. 43) notes that the produced urban landscape is both the crowning glory of past capitalist development and also a hindrance to the continued accumulation of capital 'precisely because it creates spatial barriers where there were none before'. The production of this landscape is in the end 'antithetical to the tearing down of spatial barriers and the annihilation of space by time' (Harvey, 1985, p. 43). So while most elements of the built environment produce a string of benefits which flow from them, there invariably comes a time when these elements are superannuated and no longer economically, nor often socially, efficient. To redress this situation (i.e. to demolish and redevelop) is, by virtue of the nature of the built fabric, a time-consuming and expensive process. Without attempting to pre-empt the report recommendations, it is immediately apparent that the largely underdeveloped study area represents an opportunity to redevelop more rapidly and economically than usual.

An anomaly in the South African context was planning's role in the design of the apartheid city, an imposition of naked social control taken to the extreme. Indeed, apartheid was organised to the point where it incorporated retrospective urban planning (Davies, 1981). The so-called architects of apartheid recognised that the social formation of society was directly linked to spatial organisation. At an intra-urban level, this was expedited by the designation of sterile buffer strips between group areas, with transport corridors frequently sited within these strips to form virtually impenetrable barriers. Perhaps the CA served this purpose in separating 'Coloured' Maitland Garden Village from 'White' suburbs, such as Observatory, to the west.

Buffer strips have been identified as lending themselves to urban infill in the process of creating more equitable, post-apartheid cities, perhaps another factor behind moves for the area's redevelopment.

Ultimately, planning exists to ensure the smooth turnover of the built environment, so that the process of capital accumulation is not impeded. This is not to say that urban planning is conservative or that it seeks to defend the status quo. Rather, planners attempt to identify tensions between the built environment and the accumulation and societal growth process, and to propose design plans for a more appropriate environment (Harvey, 1985).

Before proceeding to examine some of the more down-to-earth objectives of planning it is worth remembering that urban planning is but one of many functions which is required in the management of modern cities and that a 'city policy' is needed to ensure better city management. The Organisation for Economic Co-operation and Development (OECD, 1990) has devised policies for cities and has recommended six policy guidelines which it believes are critical to the proper administration of cities. One of these is of particular relevance to the urban planning function, *viz.* each city must have a strategic vision and a development framework. This serves to confirm the importance of planning in regulating the political economy of urban areas and highlights the fact, to be examined later, that there is also a large subjective component in land-use planning.

3.3 The Functions of Planning

Ardent supporters of free enterprise might argue that the planning function is entirely superfluous and that land-use decisions are best left to the market, which will allocate parcels of land in a far more efficient manner than any planner could ever hope to. Planning simply amounts to intervention in the land market. This is a fairly extreme view and there is general agreement that there are good 'neutral' functional reasons for government/local authorities to intervene in the land market (Baken, 1992). These include:

- the difficulty most of the population have in getting access to land and services;
- land demand by the public sector itself;

- the need to act beyond the level of individual landowners for purposes of planning, distribution of public services, cross-subsidisation etc.; and
- tax raising purposes.

More recently, planners have come to recognise that planning also has a role to play in the preservation of valued (urban) environments (Wilkinson, pers comm).

The planning function is intrinsically linked to these points (excepting tax-related issues which are less of a planning objective). The interventionist nature of planning is best justified in regard to the provision of public goods (e.g. streets, sidewalks, parks etc.), where market failure is most likely to occur. Amenities of this nature do not generate a financial return in an easily quantifiable sense, but metropolitan planners are in a position where they can, on a metropolitan level, internalise the positive environmental externalities associated with their provision (Harvey, 1985). Although the point was made earlier that intervention in the land market is for 'neutral' reasons, planning itself is unavoidably a normatively laden exercise and the planner needs to envisage in advance what sort of land-uses might be appropriate (Wilkinson, pers comm). There is an inter-relationship between the design/planning process, the purpose of the design, and the situational circumstances which combine to suggest an appropriate course of action/development (Lynch, 1981).

In a more specific sense, planning is designed to separate different kinds of land-uses in order to achieve an improvement in health and safety, a reduction in pollution and nuisance, a more simplified future planning framework and optimal functional efficiency (Lynch, 1981). Functional efficiency is a catch-all statement which aims to ensure the (economic) intercompatability of the entire range of urban land-uses and, therefore, focuses not only on traditional zoned land-uses, but also on transport corridors, infrastructure, servitudes and other less static forms of land-use. And although a normative component is implicit - and often explicit - in this planning procedure, this is not to say that planning methods, one of which is outlined in a rudimentary manner below, do not have a significant scientific basis.

3.3.1 Planning and Implications for this Dissertation

Given a tract of land and a free hand to suggest appropriate land-uses, a situation not too far

removed from the status of various parts of the CA, the planner's first task is to undertake some form of site differentiation as determined by a number of variables (Wilkinson, pers comm). These vary depending on circumstances, but usually include: accessibility; edge conditions (i.e the relationship between the site and adjacent sites and the nature of the boundary separating them); site identity and legibility (i.e. how easily can the site users interpret their immediate surroundings); and environmental factors.

Planning, therefore, is not a simple process and Wilkinson (pers comm) suggests that there are three critical prerequisites for effective and meaningful urban planning:

- a theoretical understanding of urban processes and patterns;
- an understanding of planning constraints and possibilities, e.g. legal, institutional; and
- an ability, acquired primarily through training and practice, to juxtapose different land-uses creatively.

This raises interesting questions *apropos* this study and implies that it would be foolhardy, given the very different emphases of IEM and planning training, to attempt a high-resolution planning exercise. There are levels of planning, and a less detailed approach and set of land-use recommendations will probably be more apposite here. Furthermore, detailed planning requires some form of structural framework; zoning is such a framework, but is increasingly deemed to be static and inflexible. Newer approaches to planning aim to reflect economic and social demands and allow for greater flexibility, increasingly manifested in the form of mixed land-use.

The 'package of plans' approach offers a more flexible framework and is currently favoured by the CCC Planning Department (Aberman, 1993a). This is basically a tiered approach to planning with each tier being more detailed and site specific than its predecessor. So, for example, the first tier sets out the contextual framework, while the second tier is more properly viewed as planning *per se* and proposes a development framework which determines the primary level of spatial land-use. This is then translated into more detailed precinct plans and at the next level - site development plans - 'budgets' of land-use within the precincts are scheduled. This

is already a detailed and complex planning undertaking, but is frequently taken one step further in the preparation of building plans

It would seem prudent, bearing in mind the preceding discussion, to devise in this dissertation no more than a development framework for the CA, one which identifies areas appropriate for (re)development and those which are better left undeveloped, i.e. as some form of open space. To differentiate between specific land-uses would exceed the ambit of the present exercise and require a degree of expertise which, given time limitations, is not available.

3.4 Planning and IEM

Lynch (1981), consistent with his normative paradigm, proposes a set of interpretive criteria and meta-criteria for evaluating planning. These meta-criteria, though not named as such, are better enunciated by Stauth (1989) and deal with the issues of efficiency, equity and sustainability. The latter criterion is perhaps the most revolutionary (in the sense that it has only recently been recognised as important) and is one of the central tenets of IEM theory.

In the normal course of events, IEM finds most frequent expression in the form of Environmental Impact Assessments (EIAs). However, there are instances, such as this CA study, where IEM theory and methods are applied in order to assess optimal land-use, often in terms of opportunities and constraints posed by environmental factors. In these cases the environmental and planning disciplines overlap, frequently causing dissatisfaction in both camps. Indeed, there is a proposal that the planning process be subject to EIAs, which is causing some consternation within the planning community who believe that this will 'freeze up' planning, causing major delays in development at a time when SA can ill afford such delays (Wilkinson, pers comm).

Part of the problem arises because of the perception that planning is a linear process with insufficient feedback loops. Zube (1980) identifies the following series of events :

problem identification -- policy formulation -- inventory existing conditions --
-- proposed plan -- implementation.

This CA study is patently concerned with listing and evaluating existing conditions, but also strays into planning territory as defined above. Yet the IEM philosophy demands environmental input on an ongoing basis and in parallel with numerous other development related activities.

From the environmentalist's point of view, however, some of the problem derives from the perception that EIAs continually react to proposals and have very little opportunity to maximise potential environmental benefits. And although environmentalists will concede that environmental input is certainly not the sole determinant of land-use planning, they stress that input must be made at the forward planning stage and that, until recently, EIA has taken place 'in the context of completely inadequate land-use planning, with little concern for environmental objectives' (Whitaker, 1984, p. 8).

Furthermore, IEM takes a systems view of the natural environment, which planning seldom does. Planning is far more concerned with cadastral boundaries and associated ownership rights and not with natural ecological units. 'Land-use planning formalises the separation between nature and abstract space through....legal statute(s)....which impose a site-based, rather than system-based, narrative structure....(and) reinforces an atomistic interpretation of the environment' (Whatmore & Boucher, 1992, p 169). Even the most environmentally sensitive urban planning is, to some degree, impelled to adopt this approach.

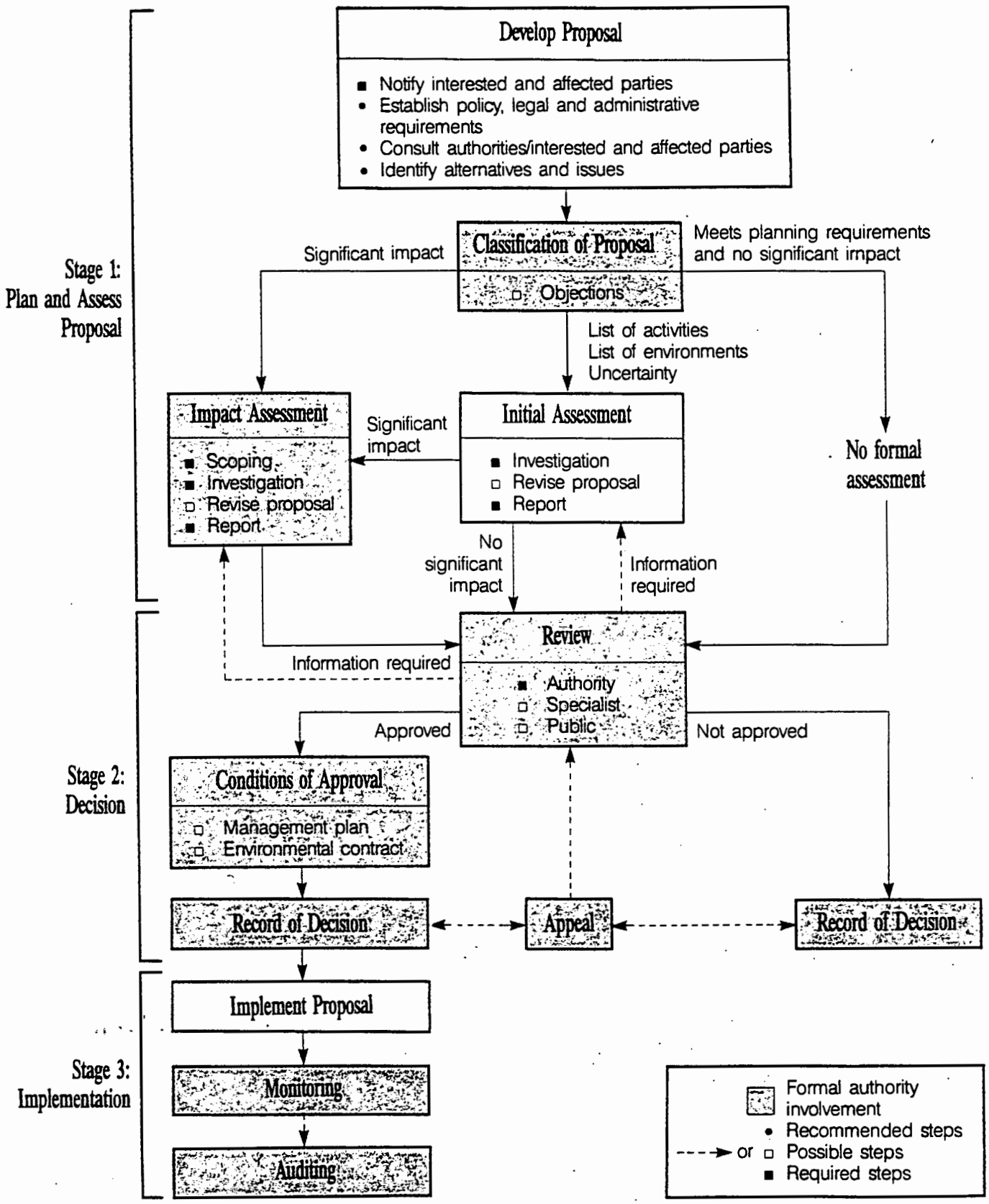
Planners might go so far as to endorse Zube's serial view, but contend that planning naturally takes certain factors (e.g. economic, social, political and, more recently, environmental) into account and that EIAs should simply be a systematic, analytical review of (good) planning (Wilkinson, pers comm). In this view, EIA is merely a step between planning and accountable, open decision-making, and environmental considerations are now afforded the attention they deserve.

One of the key conscious aims of IEM is to incorporate environmental considerations at the earliest stages (policy, planning) of development. In the context of this study, the CCC has ensured that environmental factors are considered at the proposal stage. In terms of the IEM procedure (see Figure 1), planning itself is the project action, currently at the 'develop proposal' stage of the procedure. Already, most of the required and recommended steps have been

complied with and planning will have to respond to environmental factors and not be a purely profession-driven exercise. That does not necessarily make the task easier for planners, who might be called upon to accommodate conflicting and technically inefficient demands.

At the very least, this friction between planning and environmental management should be considered and, in the context of this study, is further ammunition in defence of an approach aimed at dovetailing with rather than duplicating the planning function. This dissertation, therefore, does not take on the over-ambitious task of making detailed land-use proposals. Rather, it applies a rigorous and systematic environmental evaluation procedure to the baseline data on the CA in order to inform future planning and development actions.

FIGURE 1: THE IEM PROCEDURE



CHAPTER 4

Evaluation Methodologies

4.1 Introduction

This chapter comprises a generalised pre-evaluation discussion of the various methods available for a landscape evaluation exercise. It will be seen that because this is not an EIA (for which most methods are designed), many of the methods are inappropriate for this evaluation. Upon evaluation, the McHarg overlay method is selected as being most useful for the presentation of the geographic controlling factors, though it will need to be customised to better fit the requirements of this dissertation. Finally, there is a discussion of land-use capability and land-use suitability, without which the landscape evaluation in chapter 5 cannot proceed.

4.2 Landscape Evaluation Methods

Although not an EIA, this study could readily be construed as a type of pre-emptive impact assessment and lends itself to many of the analytical methodologies frequently deployed in the execution of EIAs. A brief review of these methodologies, in order to illustrate their respective advantages and shortcomings and explain the choice of methodology employed in this study, is therefore appropriate.

Stauth (1993) insists that there are three critical tasks which EIAs must expedite. Firstly, a list of well-defined impacts must be generated; secondly, the relative significance of each of the impacts must be evaluated; and thirdly, evaluation criteria must be applied in an explicit way in selecting the preferred proposal, i.e. a transparent decision-making apparatus. In fact, it seems that one task has been omitted by Stauth: the second task in EIAs must be to evaluate the magnitude of impacts in some form of rating exercise. In practice it has been the moulding together of the magnitude and significance of impacts which has proved most problematic for EIA practitioners and much of the theory has been devoted to resolving this problem.

This study cannot be concerned about the impacts of development; it is, rather, an evaluation of environmental factors so that the best land-use decision can be taken. In that sense it is about minimising potential impacts. In common with EIAs, therefore, it must explicitly instigate a rating and ranking of environmental controlling factors, but should allow the final decision to be made by a publicly accountable body, probably the CCC. Similarly, this report is only superficially concerned with the identification of controlling environmental factors (see section 2.3), which was the task of the baseline study.

4.2.1 Comparison of Methods

As an initial point of departure, EIA methods naturally suggest themselves for this study, but there is a plethora of methods from which to choose. In a very useful and concise review, Thompson (1990) has grouped 24 different methodologies into six categories and evaluated them against a number of criteria, including their rating and ranking capabilities. These are listed below, together with accompanying critiques which indicate that, though there are elements of each method which could be usefully employed in this study, no single method is wholly appropriate.

i) The Water Resources Assessment Methodology, devised by Solomon *et al*, makes explicit use of a complex scaling/rating scheme and also requires that an interdisciplinary team assigns weightings to the environmental components so as to establish their relative significance. The weightings and scalings are ultimately multiplied together to provide an aggregate score per alternative. The (very sensible) requirement that an interdisciplinary team participate and the overly complex scaling method preclude the adoption of this method for the CA investigation.

ii) Crawford's (1973) Methodology also aims at making an explicit trade-off between alternatives possible. The rating, significance and probable consequences of impacts are all submitted to extensive public involvement, normally by means of the Delphi technique, before an aggregate score per impact is derived. The emphasis on alternatives, which cannot be easily inverted and viewed as options to be investigated, disqualifies this method. Furthermore, this method is time consuming and therefore ruled out for this study.

iii) The PADC Methodology of Clark *et al* (1983) is concerned more with the significance of

impacts and less with their magnitude. Significance is determined by a choice along five designated polarities, i.e. adverse/beneficial; local/strategic; short-term/long-term; reversible/irreversible; and direct/indirect. The method is far too vague to be generally applied, but the polarities might be usefully applied in translating the significance of environmental criteria into suitability and unsuitability criteria.

iv) The Leopold Matrix keeps magnitude and importance/significance separate and proposes that importance values are based on the subjective and professional judgment of the evaluator. (This is not as unscientific as it seems, when one considers that even the most objective of methods has implicit value judgments built into it.) However, it becomes very cumbersome to use and comparisons are not easy, but it serves as a useful checklist of the types of environmental factors and project actions which need to be somehow incorporated into most EIAs.

v) The methodology proposed by Fischer and Davis (1973) implicitly combines magnitude, significance and a project duration coefficient in a manner which is readily open to accusations of bias. The fact that it requires an interdisciplinary team and the somewhat odd inclusion of impact duration as a key factor, rules out the use of this method for this study.

vi) Loran (1975) developed a methodology driven by computer algorithms and, ultimately, too rigorous in its insistence on a quantitative rendering of all information. This format will not prove helpful for the CA study, where I&APs views and various non-quantifiable issues will have to be analysed.

A final group of methods which Thompson (1990) fails to evaluate are those which feature checklists. The IEM approach in SA sets out a comprehensive methodology which covers far more than EIAs alone, but at the heart of this method are Checklists of Activities and of Environments (Department of Environment Affairs, 1992). While an integrated approach to environmental management is of the utmost importance, the checklist method *per se*, though a useful mnemonic, does not really constitute a methodology for the evaluation of environmental factors.

What most of these methods have in common is that they were initially designed for specific

projects (e.g. highway route selection) and only later were they formulated into general methodologies. In the process, however, they retained many of the characteristics which disqualify them for such general use. Furthermore, impact evaluation methods cannot simply be assessed on paper without an awareness of a specific evaluation and the circumstances in which it is to occur. In this regard there are a number of instructive points to be made about the CA study:

- Chapter 3 (Planning) should serve as a caution indicating what is feasible in this dissertation. This study cannot presume to venture too far into the planners' domain by suggesting a number of different land-uses. Rather, it would be more sensible and credible to aim for some sort of strategic development framework which determines only the primary level of spatial land-use. In all likelihood, that will be to differentiate between development and non-development zones. The emphasis, therefore, will not be on the comparison of alternatives as the development versus non-development debate is two sides of the same coin and requires only one decision . Nearly all of the evaluation methods discussed earlier contrive to make possible the comparison of alternatives, which, given the complex machinations required, makes them less suited to this study.

- Section 2.4 indicates that there are both quantitative and qualitative environmental controlling factors which need to be addressed in this study. Most of the evaluation methods aim for the blanket quantification of data, in the process often rendering it meaningless. It seems more advisable, especially in the case of the CA where much of the qualitative information can only be resolved at the decision-making stage, to keep these two sets of data separate. This also has the advantage of guaranteeing a far more legible presentational format, which in itself is one of the key requirements of impact assessments (Fuggle, 1992).

- After only the minimum of evaluation, the baseline study has already revealed that there are relatively few environmental controlling factors within the CA. For example, after only a few site visits and the preliminary assessment in the baseline study, it is clear that the flora and fauna of the area do not present notable land-use constraints. And to a large extent, nor, for example, does the geology.

It is clear that the CA is readily divided into a small number of functional parcels of land, especially when it is remembered that this is not a multiple level planning exercise. A consequence of this is that mapping, which can often degenerate into a complicated and confusing undertaking, becomes a much more feasible and appropriate option. For similar reasons and given the evaluator's awareness of the projected output of such an exercise, the overlay method becomes very attractive. This method also has the advantage, sometimes viewed as a disadvantage, that quantifiable, mappable data can be presented separately from that which should be qualitatively assessed. And as this study forms part of a CCC planning exercise, it seems appropriate that a mapping-based methodology is utilised. Furthermore, overlay methods frequently are formulated in terms of land-use rather than development, making them still more suited to this study.

The six methodologies discussed earlier in this section are therefore rejected in favour of a customised form of the McHarg overlay method which will, therefore, form the foundation of this study's environmental evaluation. It is discussed in the next section.

4.3 McHarg Overlay Technique

4.3.1 Introduction

Thompson (1990), in his assessment of EIA methodologies, is interested in the extent to which they encourage the formulation of low impact alternatives. The McHarg method surpasses all others in this respect: the whole purpose of the process is to create low impact alternatives. It is an essentially ecological approach (although it does incorporate social values) and allows environmental factors to determine optimal land-use in the best location.

Veitch (1978) identifies seven different ecological approaches to land-use planning, including McHarg's. He makes the point that all seven of these approaches must consider three variables and that the way in which these variables are treated is what distinguishes the methods from each other. These variables are: location; the development action or proposed land-use; and environmental effects/factors. 'Given any two of these factors, it is presumed that the third can be determined with some degree of accuracy by applying the hypothesis that particular developmental actions in given locations will bring about certain predictable environmental

impacts' (Veitch, 1978, p 26). This can be easily re-worked to take account of environmental determinants rather than impacts.

Basically, the choice is between dependent and independent variables, usually chosen to coincide with the aims of the study. This is the difference between land suitability and land capability studies. The former takes location as the independent variable (i.e. environmental factors and proposed land-use dictate the optimal location), while the latter makes the choice of optimal land-use variable (i.e. environmental factors and location dictate the optimal land-use). Environmental factors are quite reasonably taken as given in both instances. In the CA study, the baseline document has already established these factors.

These two methods need not be mutually exclusive and in many respects land-use suitability exercises, such as the McHarg overlay technique, are an extension of use capability approaches. Indeed, this report will argue that without a clear idea of the land-uses to be evaluated, it is not possible to designate the optimal location for those uses. This task is made considerably easier in this study by virtue of the fact that not many different land-uses will be considered, in keeping with the second level of the package of plans approach.

4.3.2 Technique Description

The McHarg method or, as it is generically termed, the ordinal combination method, has been eloquently summarised by Hopkins (1977), as set out in the description which follows. The first step is to identify all the environmental factors and, although social values are included, the emphasis is on geographic factors. These must then be mapped in terms of appropriate 'types', e.g. vegetation types and soil types must be described. This is a purely scientific exercise, devoid of any normative component and has already been undertaken in the baseline study, where this sort of information is rendered in map form.

The third step is to assess the suitability ratings for each land-use against each type. Different criteria, determined in as objective a manner as possible by the evaluator, apply to each of the different factors (e.g. slope might be the appropriate criterion for the geomorphological factor, while floodlines might apply to hydrology). It is usually the case that the ratings run along a continuum from *very suitable - suitable - unsuitable - very unsuitable* and that they are

represented graphically by shadings which get progressively darker as one moves along this continuum. These shaded areas are represented on a suitability map for each environmental factor.

The fourth and final step consists of overlaying the suitability maps of individual factors to produce a composite suitability map (for each different land-use, if more than one is being investigated). Clearly, the potential exists for a mass of differently shaded maps to be overlaid to produce an illegible map, rather than a set of neatly bounded, markedly differently shaded facets. This is where a familiarity with the study site, the relevant environmental factors and the proposed land-uses is important. Without the knowledge that the shading permutations are fairly limited, the utilisation of this method is not advisable.

Even with a limited number of shading options, it would often be useful to have some other form of presentation available. Beaumont's (1975) filtered overlays are an advance in this respect and utilise both a shading and a numbering or lettering system (for example A B C D , where A is very suitable, B is suitable, etc). This system will be incorporated into the evaluation proper, presented in Chapter 5.

4.3.3 Critical Assessment of McHarg Overlays

Overlay techniques are far from perfect, but they do have advantages too. As has been noted, this technique promotes the selection of low-impact land-uses and in that way acts as a counterbalance to overzealous developers. At the same time it guarantees, inasmuch as that is possible, that the best land-use in the optimal location is chosen. This will result in lower development costs, although some of the cost savings might only be realisable in the long term. By taking ecological costs into account and imputing costs to them where they are not currently apparent, the McHarg technique is subscribing to the principle of sustainable development, one of the three meta-criteria mobilised in the assessment of urban planning. It is also in accord with the principles of IEM.

Suitability maps are also advantageous in that they are excellent communicators of spatial information, which is imperative in the formulation of land-use plans. In a related way, suitability maps are procedurally in the correct place in that they are immediately antecedent to

the design function (in compliance with the approach of this dissertation).

Some of the disadvantages of the McHarg overlays have already been alluded to: the composite suitability maps can only accommodate a limited number of factors before they become illegible. In addition, maps, with their precise boundaries, must inevitably hide uncertainties in the data. For example, it is inconceivable that vegetation types change along precisely defined boundaries, yet that is how it must be represented in this method. A further problem is that critical issues are not highlighted and some alternative form of evaluation will have to be employed to pinpoint these.

Probably the major drawback of this technique is the implicit equal weighting of the environmental factors. (By 'adding' all the factors to compose the composite overlays, the method inherently assumes that each factor is of equal significance.) Value judgments tend to get hidden in the process. These problems are not insurmountable and various methods have been devised to get around them. The explicit weighting of factors is one such solution, but normally requires a representative selection of I&APs or a multidisciplinary team. The Swartkops Study (1971) divided the controlling environmental factors into primary and secondary groups on the basis of the different financial costs attached to each factor.

Despite its shortcomings the overlay method lends itself well to the evaluation of the geographic controlling factors, especially in the sense that it is flexible enough to meet the demands of most landscape evaluation exercises. Before proceeding to the actual evaluation, further points about land capability need to be outlined.

4.4 Land-Use Capability

Land-use capability and suitability present something of a chicken and egg problem: both techniques work better if the other technique has been applied beforehand. In many ways, land suitability analysis is the corollary of land capability analysis, although the confused understanding of these two approaches is not helped by some conflicting definitions in the theory (Whitaker, 1984). It is, however, normally the case that capability analysis precedes suitability analysis/assessment and this will be the sequence adopted in this study. There are good reasons

for doing so, most of which have been previously mentioned.

Capability methods aim to ascertain the optimal land-uses, given the determinants of location and environmental factors. It is quite feasible within the bounds of this report to ascertain optimal land-uses on a site-specific basis, and this might simply be done by starting the analysis with a list of land-uses derived from ordinary zoning documents, e.g. residential use, light industry, recreational use etc. However, the contextual framework would be lacking and without an appreciation of the nuances and possibilities of urban planning, it would seem pointless to proceed in this ambitious, but uninformed manner. So, for example, aesthetic factors might indicate that certain types of industrial land-uses are inappropriate in certain areas of the site, but this would not take into account a number of other broader planning imperatives which together conclusively prove that industrial use is optimal, no matter what the aesthetic impacts.

The package of plans approach makes specific allowance for initially determining only the primary level of land-use. This, too, has the advantage of making the suitability evaluation far more comprehensible. In effect, only one set of land-use maps will be necessary and there will be no overlap of optimal land-uses.

In Chapter 5, therefore, only two land-uses will be considered, *viz* land suitable for some form of (re)development and land which is not suitable for (further) development. Thus in effect this suitability analysis needs only examine a single land-use as the other land-use will be derived by default. (That also partially explains why this analysis could easily be construed as a land capability analysis.) Before proceeding to the evaluation in chapter 5, land-use suitability is discussed, with particular reference to the rating scale which will be employed.

4.5 Land-Use Suitability

As has been indicated earlier, the suitability approach assumes land-use(s) and aims to determine the optimal location for that use. Veitch (1978), however, notes that suitability is a comprehensive term embracing three forms of suitability, *viz*. use suitability, intrinsic suitability and natural suitability. An understanding of these three forms of suitability will help in appreciating the suitability ratings which are to be utilised in this study, and their relationship

with development.

Use suitability is the relative ability of a specified area in its present condition to produce specific goods and services. In this sense suitability refers to the amount of management effort required to overcome limiting site conditions (and the present land-use) in order to bring the site to its optimal level of utility. It is a pro-development view of suitability and is not overly concerned with the adverse impacts arising from the narrowing of the present use and potential use gap.

Intrinsic use better describes the approach favoured by McHarg. It recognises the inherent composite value of a specified area for a prospective land-use based on the opportunities : constraints ratio for that land-use (Veitch, 1978). McHarg developed criteria to define intrinsic suitability in relation to a proposed land-use. For example, urban land-use is partially dependent on:

- slopes less than 5%;
- not in the 50 year floodplain; and
- not in high/exposed elevations (McHarg, 1969).

Natural suitability is not very different from intrinsic suitability, but in addition anticipates some of the impacts flowing from a certain land-use (on the assumption that future land-use is known) and feeds these impacts into the analysis. This study draws on all three approaches, but is primarily an intrinsic suitability exercise. However, the potential suitability of certain developed areas for re-development is best explained in terms of the use suitability approach.

4.5.1 Suitability Rating

Suitability rating requires that environmental factors be assessed and that their cumulative effects be presented in a form which allows for their 'addition'. It is therefore essential that the criteria applied to each environmental factor be reduced to a common rating system so that they can be presented together on the composite overlay map. In selecting a rating system two points need to be considered. The first of these is the rating range, i.e. how many levels of rating are required? Where very precise land-uses are being investigated, it is obvious that a greater level

of detail will be required. In this study, however, four levels will suffice, and at times provide an even more detailed degree of resolution than is required. These ranges are described and rated as:

- Very Favourable (A)
- Favourable (B)
- Unfavourable (C)
- Very Unfavourable (D)

A, B, C and D are the letters which will be used on the maps so as to better present the ratings, as is the standard procedure in the Beaumont filtered overlay method.

The second point is that suitability rating scales are only meaningful if suitability - in this case, favourability - is expressed in relation to something, usually the appropriate land-use. This is often a more convoluted task than it first appears. In the CA the distinction is ostensibly between development and non-development. That, however, cannot be the case; a considerable portion of the land has already been developed, but that does not imply that it has been most suitably utilised. In terms of the earlier use suitability discussion, there might be a gap between current and potential optimal use. This suggests that some presently developed land - using a conventional ' built environment' definition - might be suitable for redevelopment.

There is also a distinction to be drawn between (re)development and land-use. Thus, some land might not need to be physically redeveloped, but a different use might be appropriate. And redevelopment can also mean that only the use changes and not the physical structures. This sometimes confusing distinction between (re)development and land-use is most apparent in the rating of historical buildings where structural development is strictly prohibited, while alternative use can be actively promoted. This dichotomy is more fully addressed and resolved in the composite evaluation (see section 5.5).

An element of subjectivity and, perhaps, a degree of advocacy, is involved in assigning ratings *vis-a-vis* redevelopment, but the actual process becomes clearer in the factor rating discussions (see section 5.4). Accepting that suitability will be defined in relation to (re)development, in

terms of either new structural development or changed land-use, it is possible to more exactly define the rating scale.

- Very Favourable (A): refers to the situation where the environmental factor imposes no constraints; where some form of(re)development would optimise land-use in a patently beneficial manner; and where I&APs views have suggested that some form of change might be warranted. (All three conditions apply.)

- Favourable (B): refers to the situation where (re)development would be appropriate so as to optimise land-use, but where the environmental factor imposes some mitigatable constraints. I&APs have questioned current land-use.

- Unfavourable (C): refers to the situation where the current land-use is fairly efficient and where environmental factors impose major constraints which could only be mitigated at considerable financial and administrative expense. Very few I&APS have expressed concern over the current land-use.

- Very Unfavourable (D): refers to the situation where the current land-use is to all intents and purposes 'fixed' or where major constraints are so evident that it would be almost impossible to change what is currently viewed as an excellent land-use. Most I&APs are in favour of the current land-use.

This system is used in the rating of the primary environmental factors, which (along with secondary factors) are the focus of chapter 5.

CHAPTER 5

Evaluation

5.1 Introduction

This chapter is the evaluative core of the report, although the examination of issues and procedural concerns raised by I&APs is held over until Chapter 6. The baseline report identified environmental factors which could be expected to influence land-use in the CA. This chapter examines the geographical factors and, on the basis of a number of explicitly stated considerations, groups these factors into primary and secondary groups according to their relative significance to a land-use decision. Each of the secondary factors is investigated in moderate detail. The primary factors are the subject of more in-depth investigation and the McHarg overlays, and are rated based on sets of specific criteria appropriate to each. The three primary factors are of a physical, cultural or 'socio-spatial' nature. A suitability map is produced for each factor after which these are overlaid to produce a single composite suitability map.

5.2 Distinguishing Primary and Secondary Factors

In any environmental evaluation exercise it is reasonable to expect that a great number of potentially significant environmental factors will be identified. Indeed, the checklist approach favoured by IEM ensures precisely that (Department of Environment Affairs, 1992). This type of approach has the result that a great number of factors is considered, yet it is invariably the case that not all of them are important at all. In that case, assuming that a more detailed evaluation of factors is to follow, it would be prudent to submit the factors to a preliminary 'edit' so that only those factors which are of major importance are analysed in detail. As has been shown, this type of editing is almost a prerequisite for the McHarg overlay technique.

An objective of environmental evaluation is always to be as unbiased as possible, yet it must be conceded that the distinction, in this study, between primary and secondary factors includes an

element of subjectivity. There are, however, a series of considerations which have been utilised in making and justifying this distinction, and these will now be discussed in greater detail.

- Many of the environmental factors will have land-use implications of limited spatial extent. This might have mattered in a detailed planning/building exercise, but exceeds the level of detail demanded of this study (which only delineates development and no-development zones).

- Some of the factors will affect land-use options, but not to the point where they cannot be readily mitigated. This is often a question of scale, but also takes into account other variables such as the duration and reversibility of potential impacts on those factors, consequent upon a land-use (development) decision being taken and implemented. These factors, however, are not ignored and are mostly expressed as guidelines later in this report. Factors which would have only indirect consequences are similarly treated.

- The evaluation procedure is not strictly sequential as the baseline study itself had a large evaluative component to it. That study did not deal with the significance of environmental factors at all, but, although no explicit rating technique was utilised, it is clear that some form of rating was undertaken. That was particularly the case where a factor was so readily ratable, and the level of rating was so immediately obvious, that it would have been negligent not to have completed that exercise. The vegetation in the CA is a good example.

Thus, in cases where the baseline study undertook a rating exercise and arrived at categorical conclusions in which, after expert advice, it had full confidence, these evaluations are taken as given. That does not imply that these factors are primary controlling factors, principally because most of them do not act as constraints, but also for reasons to be explained in the next paragraph.

- Pilot overlays (not presented in this report) and familiarity with the study site revealed that certain factors might have certain impacts in limited areas, but that many of these factors together are still overridden/superseded by a single other factor; it was thus deemed to be far more practicable to map that single factor. In the CA, this overriding factor is usually flooding.

This approach is methodologically consistent with the 'additive' operation of overlays. In a sense it presumes that the overriding factor is more significant than all the others, but in terms of Beaumont's filtered method, a single very unsuitable rating is sufficient to disqualify an area for a particular land-use, regardless of how many other very unsuitable ratings are declared. This would not apply in the reverse case where very suitable factors are overlaid, but the pilot overlays indicated that this would not be the case in the study area.

While these considerations do not lend themselves to being evaluated in a quantifiable sense, in combination they provide a sound basis for differentiating between primary and secondary factors.

5.3 Secondary Factors

The baseline report identified a number of factors which might inform a land-use decision. Upon careful reconsideration of the preliminary assessment in the baseline report, which screened out a number of superfluous factors, it has been possible to identify those factors warranting closer inspection. Some of these factors need more emphasis than others.

On the basis of the preceding discussion it is possible to distinguish primary and secondary controlling environmental factors. A 'mini-evaluation' of each of the secondary factors is presented in this section, together with an indication of their likely implications for a land-use decision.

5.3.1 Physical Environmental Factors

The four factors examined in this part of the study are: topography; climate; geomorphology, geology and soils; and pollution. Hydrology/flooding is a primary factor and is discussed later.

In terms of its topography, the CA can best be described as gently undulating; there are no natural sharp breaks of slope. Other than in the more northerly parts of the floodplains, slopes mostly vary between 2.5% and 10%. Only in this flatter region where inundation is a seasonal problem does the absence of slope and the consequent poor drainage present a constraint on future land-use. However, problems in this area are overridden by hydrological factors and its

unsuitability will be mapped in those terms.

The CA experiences weather conditions very similar to those for the rest of Cape Town and minor local differences warrant only brief comment. High wind speeds, winter rainfall and winter temperature inversions, all of which are slightly more severe in the CA, are characteristic features of the Cape Town climate. None is sufficient to constitute a significant constraint to land-use in the CA.

The geology of the CA presents few problems. The area is mainly underlain by Malmesbury Shales, which over time have weathered to produce fertile soils, especially away from the floodplains. These soils are suited to any number of land-uses. Erosional forces have been more problematic and have introduced deposits of alluvium along the courses of the Liesbeeck and Black Rivers. This alluvium varies in colour and has been transported from different sources, but will restrict construction potential due to its low bearing capacity. As with topographical factors, this particular constraint is overridden by flooding concerns. The area north of the Liesbeeck Sportsgrounds comprises fill material, though little is known of its composition.

The CA is affected by many different forms of pollution, some of which will present minor constraints, but which can, mostly, be mitigated. Air pollution is a general pollution problem throughout Cape Town, slightly accentuated in the study site by vehicular emissions from the N2 and the Black River- and Liesbeeck- Parkways and the site's micro-climate. Department of National Health and Population Development (DNHPD) pollution guidelines are regularly breached during peak pollution events, but this applies to most of central Cape Town, where pollution does not appear to have influenced land-use at all. The CA, however, is a declared smokeless zone which, unless overturned, will impose some constraints.

Noise pollution has been identified as a potential problem in areas abutting the N2 and the Black River Parkway, but mitigating measures are available. Water pollution, especially of the Black River which is little more than a treated-sewerage conduit, is also an indirect problem for land-use. Both of these considerations are spatially superseded by the flooding factor, unlike the litter problem which is more one of collective will and cannot be planned around.

5.3.2 Biological Factors

Discussed in this section are the flora, fauna, avifauna and water quality.

The baseline study states quite unreservedly that, besides the wetlands, the CA is of no floristic value. All the indigenous renosterveld fynbos has been cleared and the CA is dominated by alien vegetation, e.g. kikuyu grass and pine trees. Areas such as those below the Vincent Pallotti Hospital, and the confluence of the Liesbeeck and Black Rivers, are characterised by invasive aliens (Rooikrans, Port Jackson and Black Wattle) which are a positive nuisance and the target of a regional eradication campaign.

The 30 ha of wetlands sustain more valuable plant communities, most notably indigenous reed, grass and sedge species. Even so alien species have invaded the wetlands as well and account for 58% of the species there and are becoming more and more of a problem - the old Liesbeeck River is almost entirely clogged up by parrot's feather. There are no rare or endangered plant species in the wetlands, but viewed more holistically - see the following discussion on avifauna - the wetlands constitute important habitats worthy of conservation and will, therefore, restrict land-use. The vegetation in the remainder of the CA should not influence a land-use decision at all.

Although no thorough investigations have been conducted, it is firmly believed that, birdlife aside, the limited animal species found within the CA are not likely to constitute a critical land-use decision factor. The same assessment would apply to the fauna present in the two rivers; these polluted rivers do not sustain any biologically significant species.

A total of 102 bird species have been recorded on the site and others are likely to occur. Over 70 of these species are waterbirds, representing about 60% of all known waterbird species in the SW Cape (Hockey *et al*, 1989). Three Red Data species have been recorded in the Black River wetlands, *viz.* the Greater Flamingo, the Little Bittern, and the White Pelican. A number of birds breed, forage and roost in areas away from the wetlands and alien trees afford a reasonably important habitat in this regard. Nevertheless, it is the wetlands and the bird species found therein which will most affect a land-use decision.

The Athlone and Borcherd's Quarry sewage works discharge nutrient-rich effluent into the Black River, leading to semi-eutrophic conditions, i.e. high nitrate and phosphate levels (Turpie, 1994). Trace metals enter the river systems from the sewage works and rainwater run-off. Despite efforts by the CCC, the levels of organic and inorganic pollution are still too high to allow any water-contact sports. Water quality, therefore, will influence (riverside) land-use.

As a general rule, all the land-use limitations imposed by the biological environment occur either in the rivers or in the adjacent wetlands, where hydrological factors are of overriding concern. Nevertheless, many of the biological restraints will later be incorporated as guidelines.

5.3.3 Infrastructural Factors

The transport infrastructure, water services, and other utility services are the focus of this section.

Many roads run through the CA. Some of them are of regional significance and as traffic congestion mounts, it is quite possible that some of these roads, particularly the N2, the Black River Parkway and the Liesbeeck Parkway, will have to be widened. At a metropolitan level they provide excellent access to the site, though actual entry into the site is not satisfactory. All roads and bridges are land-use 'fixes', but the possibility of road widening might also pose some constraints to alternative land-use options, as might road reserves such as the proposed Berkley-Malta Road link, which traverses the Liesbeeck Sportsgrounds. In addition, roads will also influence land-use in the sense that they function as physical barriers. The Black River Parkway is an excellent example of this and effectively splits the CA into two large compartments. (See section 6.4 for a detailed accessibility discussion.) In the final analysis, and recalling that this chapter is concerned with geographic factors and not issues such as accessibility, it is roads as 'fixes' which must influence a land-use decision.

Nearby railway lines and stations further improve access to the CA, but are not land-use determinants as such. Similarly, the limited network of paths in the CA do not impose major planning constraints, although some form of east-west pedestrian access will have to be retained.

Water carrying services refers to potable water supply, sewerage, and stormwater systems. The

former two are more than adequate for the current level of development, but, as is frequently the case, might have to be supplemented if certain types of land-use are proposed. That, though, does not constitute a restriction; it is simply something for which planning must make allowance. In the same way, enhanced stormwater systems might have to be catered for and at the same time the existing minor problem of stormwater periodically entering the sewerage system, thereby causing an overflow from a manhole just below the Valkenberg Homestead, could be addressed.

Other utility services include telephone lines, electricity, gas and refuse removal. The provision of these services is not a problem. The only possible limitation on land-use is a 66 000 volt cable running parallel to the eastern edge of the Black River, but as this is a narrow strip of land between the Black River and the Black River Parkway and is susceptible to flooding, this land-use limitation is overridden by flooding concerns. It does, however, mean that any proposed river widening might be preferable on the west bank of the Black River.

5.4 Primary Factors

Having examined the secondary factors and noted that most of them are superseded by the primary factors, this section focuses on these primary factors and maps each of them in terms of their relative suitability for (re)development. There are three primary factors, *viz.* flooding, historical factors and land-use/landownership. They have been selected primarily on the basis of the earlier discussion (see section 5.2), but also because they are representative of three different geographical sub-categories, *viz.* physical, cultural or 'socio-spatial'.

5.4.1 The Flooding Factor

Flooding and the threat of flooding was singled out in the baseline document as one of the environmental factors most likely to limit land-use options in a significant portion of the CA. Already, certain parts of the study area are either flooded or inundated on such a regular basis that current land-uses are not appropriate. The Liesbeeck Sportsgrounds are regularly unplayable in winter, while several buildings forming part of the SAAO have had to be demolished and relocated in recent years in order to escape annual flooding. It could be argued

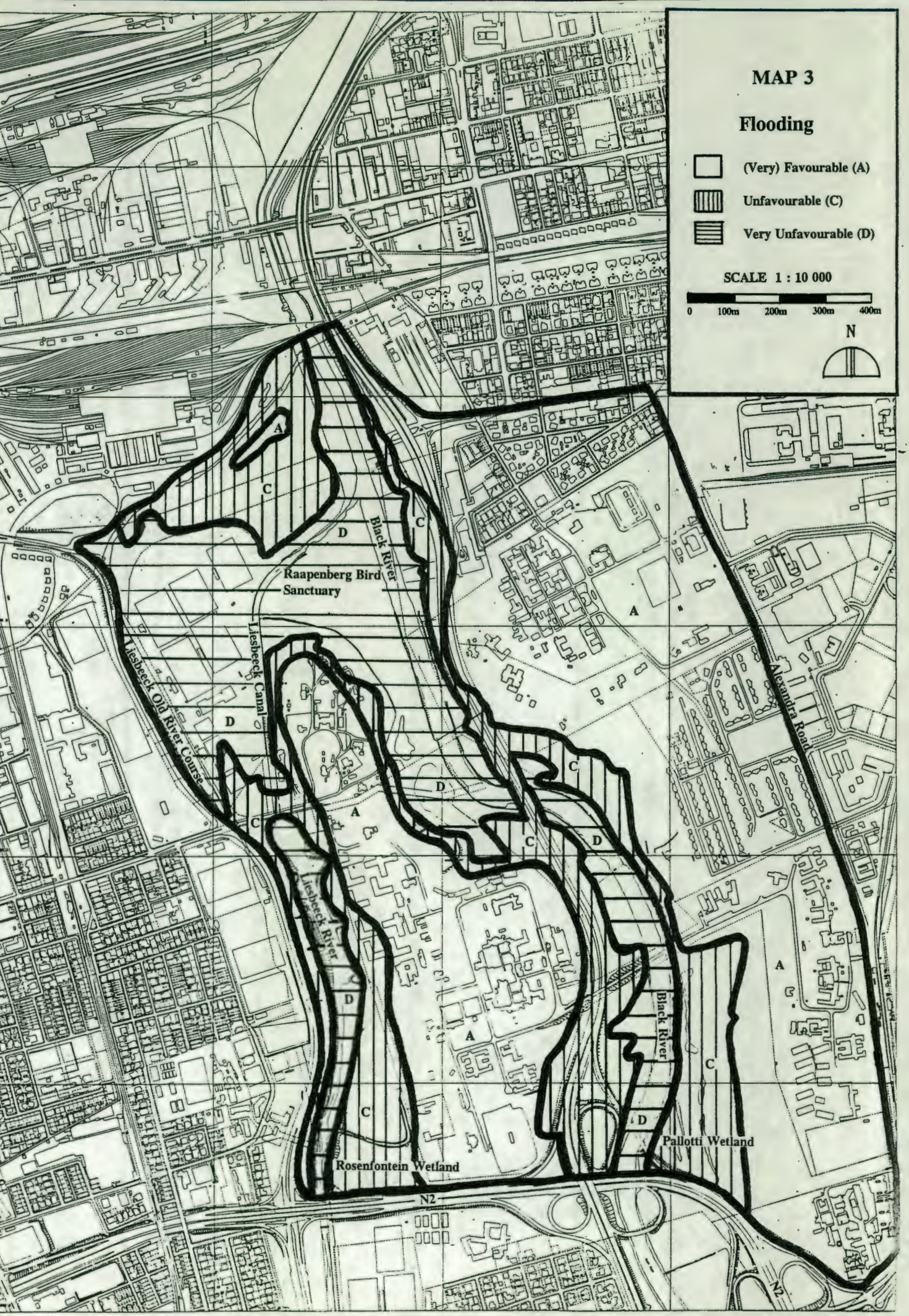
that the possible damage to structures by flooding is a risk which individuals must bear, but local authorities also have a responsibility to protect and inform citizens and need to incorporate the threat of flooding into a planning framework (Alexander, 1993).

As the catchment hardens, flooding is expected to worsen and this has prompted vigorous debate as to the best means of resolving the flooding problem. One argument is to remove the berms along the western embankment of the Black River, thereby reinstating part of the natural floodplain/wetlands, while the City Engineer is in favour of widening the river and containing it within artificial earth channels. A proposal exists to widen the Black River from its present width (approximately 20m) to 121.9m some time early next century (Peterson and Bellas, 1987). The channelisation and canalisation debate is an important one, but insufficient information is available and the issue is, therefore, only obliquely addressed in this study.

Notwithstanding the current trend in planning floodplain development towards the identification of high- and low- hazard land-uses in flood-prone areas (see section 2.4.3), there are sufficient reasons to evaluate flooding in terms of floodlines. Firstly, floodlines are easily spatially represented; secondly, there are a number of secondary factors, as already discussed, which lead one to recommend a very low intensity of land-use in the CA irrespective of its hazard rating. Floodlines, therefore, will serve as the criteria by which suitability ratings are determined. (Floodline and flooding theory is a fairly complex avenue of investigation, which exceeds the ambit of this study, but see Ward [1978] for a detailed analysis.)

5.4.1.1 Flooding Rating

When mapped, floodlines depict very distinct boundaries, with areas of different suitability for development being demarcated by these. Thus, an area within the 50 year floodline might be (very) unfavourable for (re)development, while the area outside the floodline is both favourable and very favourable at the same time. No other hydrological factors within the CA make any distinction between a favourable and very favourable rating valid and as a result a three level rating system is used to depict the constraint posed by flooding. (See Map 3.)


MAP 3
Flooding
(Very) Favourable (A)
Unfavourable (C)
Very Unfavourable (D)
SCALE 1 : 10 000
0 100m 200m 300m 400m
N
Raapenberg Bird Sanctuary
Black River
Liesbeeck Canal
Liesbeeck Old River Course
Liesbeeck River
Alexandra Road
Rosenfontein Wetland
Pallotti Wetland
N2

- Very Favourable/Favourable (A). The area above the 50 year floodlines is very favourable for (re)development. This refers to areas above 4.5m above sea level (asl) along the Liesbeeck River and above 4.6m asl along the Black River. This includes the SAAO and parts of Valkenberg Hospital between the two rivers, and most of the area to the east of the Black River, i.e. Berkley Village, Alexandra Care and Rehabilitation Centre (ACARC), Maitland Garden Village, Valkenberg eastern campus, and the Vincent Pallotti Hospital. Some adjacent CCC land is also included. There is believed to be no real threat of flooding in these areas and hydrological factors present no problems for virtually any form of development, e.g. ranging from heavy industry to low density housing to open space.

- Unfavourable (C). The area below the 50 year floodlines and above the 5 year floodlines is not suited to (re)development in the conventional sense and might be more appropriately left as open space. This includes a number of irregularly shaped areas, the largest of which are in the vicinity of the clover leaf interchanges on the N2, the northern extremity of the Liesbeeck Sportsgrounds, and the Rosenfontein wetland below the Valkenberg Homestead. (Note that the distinction between the 20 year and 50 year floodlines has not been drawn because on the ground this is a strip of land 5 - 10m wide, of an irregular shape and not meaningful in planning terms. Furthermore, the importance of 50 year floodlines as planning constructs has been formally recognised. In terms of the Land Use Planning Ordinance 15 of 1985 (sections 14 - 18), rezoning applications below 50 year floodlines, unless approved in a structure plan, are excluded (Wiseman and Sowman, 1991). The Council for the Environment also recommends restrictions on development below 1-in-50 year floodlines.)

- Very Unfavourable (D). The area below the 5 year floodlines is regularly flooded and not at all suited for development. This means that all areas below 3.4m asl in the CA are wholly unsuited to development. The most significant areas are parts of the Liesbeeck Sportsgrounds, the Raapenberg Bird Sanctuary and the immediate fringes of both rivers. This does not necessarily imply that existing buildings within the 5 year floodlines be removed, but that, even where mitigation is possible, it would still be imprudent to develop in this area.

5.4.1.2 Comments

It is interesting to note that with few exceptions, existing development conforms with this

floodline analysis and rating, and there are very few buildings within the CA inside the 50 year floodlines. Those areas which are presently used, such as the Liesbeeck Sportsgrounds, experience regular problems with inundation and cannot be efficiently utilised throughout the year. This confirms the choice of the 50 year floodlines as the deciding criteria making an area favourable or unfavourable for (built) development.

5.4.2 Historical Factors

It is reasonable to suggest that a large part of the CA, particularly areas nearer the Liesbeeck River, is of national historical significance. The entire CA (and beyond) has been inhabited for thousands of years and it is presumed that there are numerous yet-to-be discovered archaeological sites. What is known, is that the area adjacent to the Liesbeeck River was the first to be awarded to the free burghers, in 1657 (Thom, 1954). There are many buildings of indisputable historic significance within the site.

Yet it is not readily apparent what makes something - a building - historic. Often it is simply a question of age. 'Things are new; next out of date, worn, and discardable; and only later are they reborn as historic. A wave of discovery follows after an interval, now sometimes as little as 30 years' (Lynch, 1981, p 258). How much time needs to pass before something is deemed historic is a subjective decision, influenced by the situational context. A 50-year-old building might be historic in SA, but not in Europe. Other factors will also be important, such as the rarity of a building, its physical condition, the quality of building materials and design, and the nature of the surrounding precincts (Marx, pers comm). In SA all buildings over 50 years old are automatically protected and a permit must be obtained from the National Monuments Council (NMC) before any alterations can be made.

These factors are incorporated and made explicit in the rating section which follows. It should also be apparent that only historic buildings and surrounding precincts will be rated and that, in an urban context, it is not always plausible to designate vast areas as being of historical significance. At times, therefore, the rating/lettering system will apply to specific buildings only. The emphasis, by virtue of the nature of historic buildings, is on those which are unsuitable for (re)development. In the case of historic buildings, this means that the buildings should not be demolished or physically altered, and not that they cannot be differently utilised.

It might also mean that certain historical buildings, currently in a state of disrepair, could benefit from redevelopment, assuming that certain (architectural) guidelines are adhered to. The Waterfront, in Cape Town, is a good example.

5.4.2.1 Historical Rating

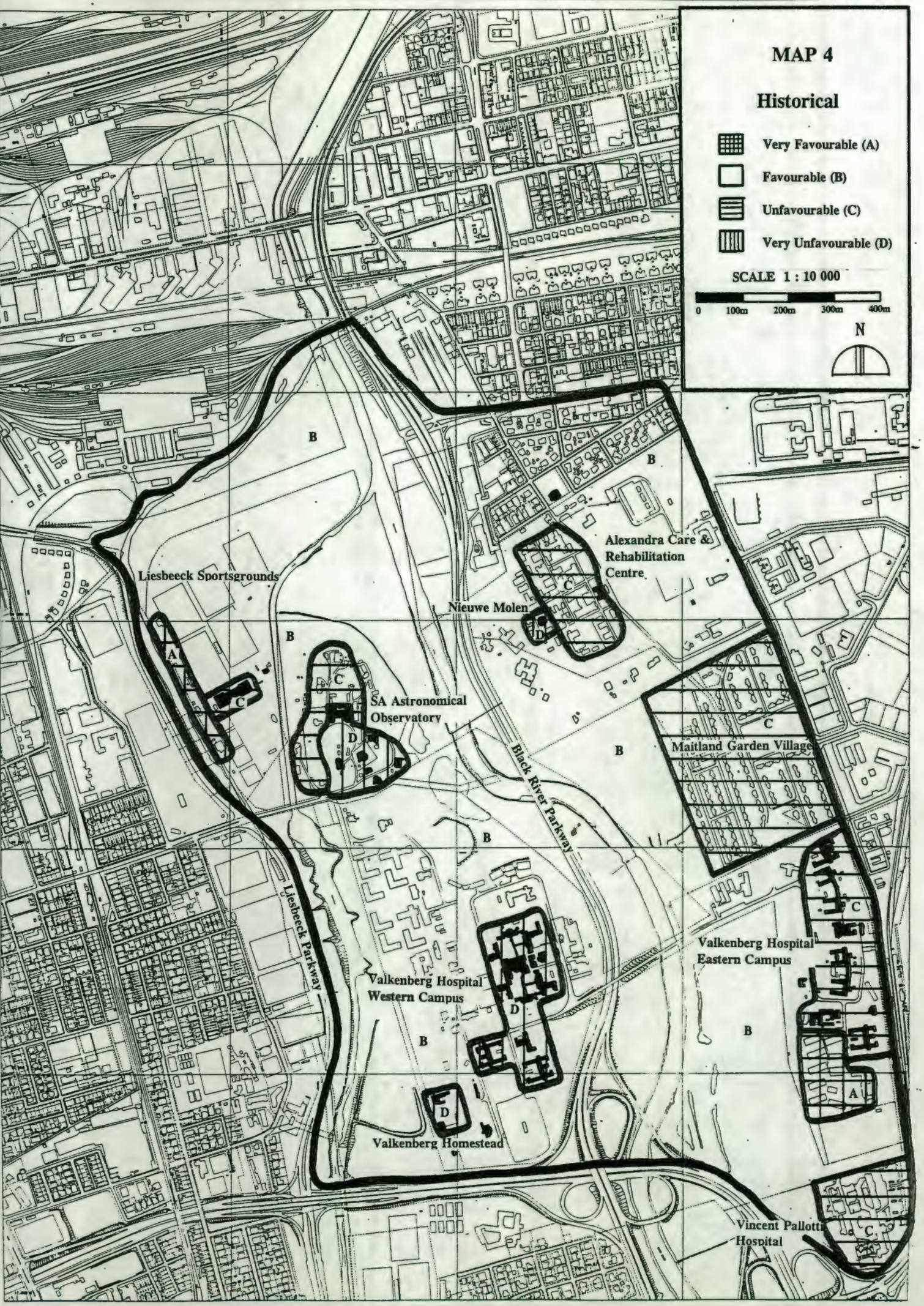
(See Map 4.)

- Very Favourable (A). All buildings of relatively recent construction (25 years), which are poorly designed, in a state of disrepair, are not deemed worthy of restoration and which are grossly underutilised, fall into this category. Very few buildings fit this description, other than a collection of prefabricated buildings on the Valkenberg eastern campus and a couple of maintenance buildings in the Liesbeeck Sportsgrounds.

- Favourable (B). This refers to newer buildings of little recognised architectural value, of which there are not many examples in the CA. Some of the buildings further removed from the historic cores of Valkenberg and the SAAO, the strip of commercial and industrial buildings adjoining Berkley Village, and Berkley Village itself are the only examples.

- Unfavourable (C). These are buildings or complexes over 50 years old, but which were not part of the first wave of construction in the area (1657 - 1830). They are architecturally significant, but not necessarily unique nor the best examples of their architectural genre. Within the CA they are frequently buildings for which a different use might be appropriate. Buildings rated as unfavourable for structural (re)development are:

- the Liesbeeck Sportsgrounds building, built in the 1930s;
- many of the secondary buildings within the SAAO built precinct;
- much of ACARC, first developed in 1906;
- Maitland Garden Village, an interesting example of 1920s urban design;
- Valkenberg eastern campus, mostly built this century; and
- the Vincent Pallotti Hospital (1938).


MAP 4
Historical
Very Favourable (A)
Favourable (B)
Unfavourable (C)
Very Unfavourable (D)
SCALE 1 : 10 000
0 100m 200m 300m 400m
N
Liesbeeck Sportsgrounds
Alexandra Care & Rehabilitation Centre
Nieuwe Molen
SA Astronomical Observatory
Maitland Garden Village
Black River Parkway
Liesbeeck Parkway
Valkenberg Hospital Western Campus
Valkenberg Hospital Eastern Campus
Valkenberg Homestead
Vincent Pallotti Hospital

- Very Unfavourable (D). These are frequently the oldest buildings in the CA, already recognised by the NMC as national monuments. They have been well maintained and are excellent examples of their type (as recognised by the NMC) and as with the unfavourably rated buildings are often well suited to an alternative land-use. They are:

- the main SAAO building and some of the associated buildings, dating from the 1820s;
- the core of the Valkenberg western campus, dating from the 1890s;
- the Valkenberg Homestead, occupied since 1713, but in its present form since 1807; and
- the Nieuwe Molen inside the ACARC boundaries, completed in the late 18th century.

5.4.2.2 Comments

In effect there are three groups of buildings which, for purely historical reasons, must be retained. This is not to say that they could not be differently utilised, but rather that they should not be physically tampered with. These are: the southern component of the SAAO precinct; The Valkenberg Hospital administrative block and immediate surrounds; and assorted buildings which are not part of larger historical complexes, e.g. Valkenberg Homestead and the Nieuwe Molen. The exact extent of precincts will need to be carefully considered and their relationship with other buildings outside the CA (e.g. Koornhoop, Molenvliet and Westoe, all in Observatory) should not be overlooked.

There will, furthermore, be areas of archaeological interest and the baseline study made some informed predictions in this regard. As archaeological sites have not been pinpointed in advance, this study will accommodate archaeological concerns in the guidelines and recommendations section, where they need not be area-specific (see section 7.4).

5.4.3 Land-Use/Landownership Factor

Current land-use and present landownership might normally be construed as two separate factors, but in this report, aided by the careful selection of a range of criteria, they are amalgamated to form one decision-making factor. This combined factor is critically important to future land-use

plans, perhaps more important than any of the other factors. Present land rights confer on landowners the ability to drastically influence future land-use.

Two features of the CA are the relatively low number of different land-uses and, more notably, the small number of landowners mostly owning fairly large tracts of valuable urban land. Until very recently this configuration of land-use and landownership had remained stable and it is only in the last two years, with the announcements of the Gateway Park and UCT Courtyard developments, that a more dynamic situation has arisen. Perhaps the key feature of the CA is the presence of a number of institutions, mainly medical, within the site, correctly implying that the majority of the land is publicly owned. For a complete list of landowners and land-use see Appendix 2.

The evaluation and rating method of this land-use/landownership factor approaches the normative and creative element of planning referred to in section 3.2. There is a degree of advocacy about the rating system which might appear to be provocative, but it is, nevertheless, based on objective evaluation against the chosen criteria, and frequently in line with I&APs expressed opinions. The criteria which form the foundation of the rating scale are: the level of utilisation; obsolescence; the size of landholdings; the type of landownership; and location. Each of these is discussed separately below.

i) *Utilisation*

I&APs have questioned the continued legitimacy of a number of the land-uses in the CA and one of their reasons for doing so is the perceived under-utilisation of much of the land which some of these institutions occupy. This is partly a consequence of the CA falling within the Zone in Transition (see sec 2.4.1) and the periodic neglect of which such land is often a victim. Adams *et al* (1988, p 63) probably have a superior grasp of the causes of under-utilisation in noting that 'development may be delayed (and vacancy/dereliction therefore prolonged) by the unwillingness of a passive owner to sell, and this may be especially characteristic of the public sector.' They offer a number of reasons for this, but two of them are vital, *viz.* mismanagement as a consequence of landholding being incidental to their main activity, and speculative landholding

for possible future expansion.

Furthermore, in the quest for racial 'harmony', the apartheid city aimed at the complete separation and duplication of all public facilities (Davies, 1981). At best, this made certain facilities more physically accessible to some racial groups, but it was also the direct cause of their under-utilisation. Thus, the presence of two mental hospitals in Cape Town would explain the under-utilisation of Valkenberg Hospital. Under-utilised buffer strips (e.g. areas west of Valkenberg eastern campus) are also the legacy of apartheid planning.

It is difficult to define under-utilisation precisely, though it must clearly have something to do with densities of structures and frequencies of use. There are no norms to hand against which land-use and ownership in the CA can be compared, but some observations speak for themselves.

- Valkenberg Hospital occupies nearly 45 ha and has 846 beds. In contrast, the Vincent Pallotti Hospital occupies only 5 ha, has 150 beds, a frail care centre and a creche for 100 children. Furthermore, Valkenberg is not the only mental hospital in Cape Town; Lentegheur on the Cape Flats serves the same purpose. In defence of this apparent under-utilisation, it is recognised that mental hospitals require a peaceful ambience and this, invariably, demands open space between buildings.

- ACARC caters for 667 patients on 27 ha of land, not a particulary intensive utilisation of space. I&APs have raised the issue of the possible relocation of both ACARC and Valkenberg and the medical superintendent at the former is analysing administrative structures with a view to the possible joint administration of both institutions (Strauss, pers comm).

- The SAAO grounds serve a mainly administrative function - the observing station is now in Sutherland - and occupy 10 ha of land. Some I&APs believe that the observatory functions and staff should be relocated.

- The Liesbeeck Sportsgrounds occupy 13 ha and have been in a state of flux ever since Transnet closed their club there due to lack of patronage. It functions as a golf driving range

and club/pub at the moment, though large parts of it still comprise wholly unutilised fill.

- The Peninsula Golf Driving Range (5 ha) is supposedly well used, but site visits revealed no evidence of this.

- The utilisation of open space is not readily evaluated. Wetlands, for example, are 'utilised' by bird species, but not by people, kept out by the nature of wetlands, but also through restricted access to some areas (e.g. access to the Raapenberg Bird Sanctuary (15 ha) is by permit only).

There is, therefore, a case for arguing that some areas are under-utilised and that land-use (or administrative) changes might be warranted.

ii) *Obsolescence*

The urban environment is a particular spatial configuration for production, consumption and exchange (Harvey, 1985). With the progress of time, particular spatial configurations can become outdated and it is planners' role to ensure the smooth turnover of the built environment so as to prevent obsolescence. The CCC planning department's interest in the CA suggests that obsolescence might be a problem there.

A drive through the study area quickly reveals that obsolescence is, in fact, an issue; the number of vacant buildings attests to that. Colton (1989) identifies various types of obsolescence and many of these may be used to explain obsolescence in the CA. These types of obsolescence include: structural; financial; site (land-use limits realisation of site value); technological; functional (mismatch of building and use); style; perceptional; and environmental (incorporating the NIMBY [Not In My Back Yard] syndrome). Some of these are also partly reflected in the level of utilisation, as previously examined. As with utilisation, there are no standards against which obsolescence can be judged, but a few observations should make it apparent that obsolescence is, indeed, a problem.

- One of the two driving ranges is functionally obsolete.

- Many of the SAAO buildings are technologically obsolete.

- Many of the buildings on the Valkenberg eastern campus and ACARC are functionally obsolete, as are a limited number on Valkenberg western campus.

- Large parts of the Liesbeeck Sportsgrounds and CCC land are functionally and perceptionally obsolete.

It can also be safely assumed that all the publicly owned land in the CA is financially obsolete in that the benefits of current land-use do not accord with the potentially realisable site value (the rent gap). On the basis of obsolescence alone, therefore, it would seem as if there are good reasons for reconsidering some land-uses.

iii) *Size of Landholdings*

This criterion is chosen for the simple reason that it is functionally easier and more feasible to plan for large tracts of land than it is for smaller properties. Changing the land-use on smaller pieces of land is, rather, a rezoning function, which might take place within a larger planning framework. An OECD (1990) policy paper supports this contention when it posits that one of the common ingredients for a successful (urban regeneration) planning programme is large landholdings within a large (200 ha) planning area. This perfectly describes the situation in the CA where a number of large landholdings predominate and, all other things being equal, it will be easier to alter land-use on these larger properties.

iv) *Landownership*

Essentially, the distinction is between public and private land, often related to the size of the landholding: the size and ownership criteria often reinforce one another. The premise upon which this criterion is based is that publicly owned land is utilised for the public benefit and that the public, in theory at least, can elect to change land-use to produce a preferable flow of benefits. Furthermore, to change land-use on public land - usually larger in size than privately held urban land - requires only a single decision, albeit a very important one. Land-use on

private land is not subject to public sanction, except in extreme circumstances where expropriation may be required to effect a new land-use. And, with private ownership, numerous decisions relating to numerous parcels of land are required before planners have a large enough functional planning unit to deal with. In brief, it is easier to alter land-use on publicly (or institutionally) owned land.

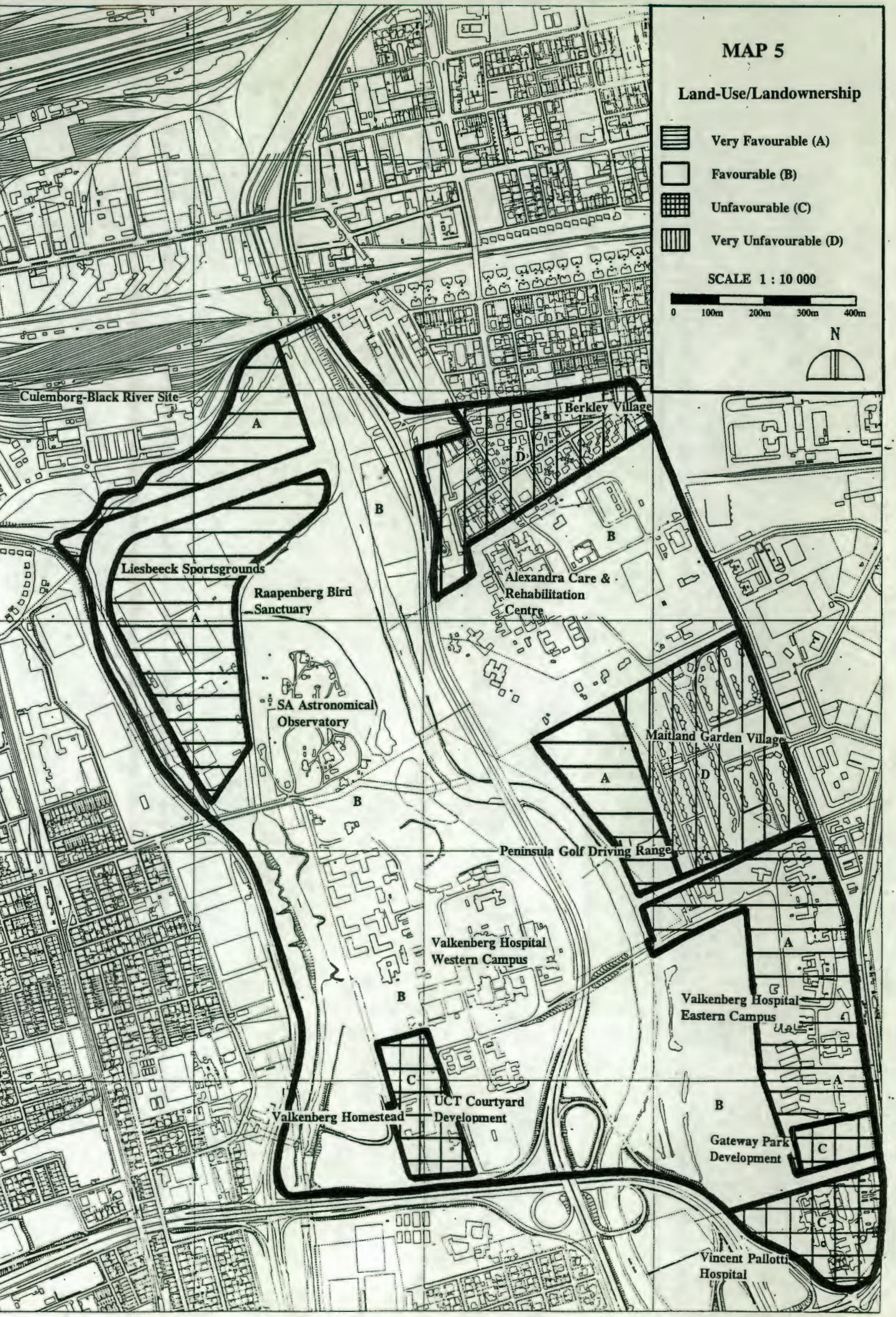
v) *Location*

Inappropriate location is a form of obsolescence, but is worthy of special mention. Location can be relative, and what was once an appropriate location may, over time, become inappropriate. Valkenberg Hospital, for example, was built at a time when mental institution 'theory' held that the mentally ill should be excluded from society in closed institutions away from urban areas (Taylor, 1989). This view still persists, though perhaps not as forcibly. Furthermore, there is now a trend towards treating the mentally ill in smaller, community-based facilities. There is a view that Valkenberg Hospital and the SAAO are incorrectly located and that there is a strong argument for locating them elsewhere in the city.

5.4.3.1 Land-Use/Landownership Rating

The above five criteria are considered together in the construction of the ratings and the various land-uses are assigned ratings on the basis of the number of criteria which they meet. Each of the land-uses rated below meets all of the criteria defining their respective ratings, unless stated otherwise. (See Map 5.)

- Very Favourable (A). Large tracts of publicly owned land, which are currently severely under-utilised, inappropriately located and largely obsolete, fall into this category. In many cases I&APs have queried the current land-use. Areas covered by this rating include: Valkenberg eastern campus; Liesbeeck Sportsgrounds; and the Peninsula Golf Driving Range, which has already been zoned for single residential dwellings and earmarked for future development.


MAP 5
Land-Use/Landownership
Very Favourable (A)
Favourable (B)
Unfavourable (C)
Very Unfavourable (D)
SCALE 1 : 10 000
0 100m 200m 300m 400m
N
Culemborg-Black River Site
Berkley Village
Liesbeeck Sportsgrounds
Raapenberg Bird Sanctuary
Alexandra Care & Rehabilitation Centre
SA Astronomical Observatory
Maitland Garden Village
Peninsula Golf Driving Range
Valkenberg Hospital Western Campus
Valkenberg Hospital Eastern Campus
Valkenberg Homestead
UCT Courtyard Development
Gateway Park Development
Vincent Pallotti Hospital
A
B
C
D

- Favourable (B). Similar criteria as per (A) apply, except that at least one of them, often under-utilisation, must be absent. This includes: ACARC; Valkenberg western campus; the SAAO; and the CCC land either side of the Liesbeeck and Black Rivers, extending up to Valkenberg eastern campus and the Vincent Pallotti Hospital in places.

- Unfavourable (C). This rating applies to smaller, privately owned units of land which are well utilised or in the process of being returned to use. In the CA this refers to the UCT Courtyard development, the Vincent Pallotti Hospital, the NMC land (i.e. Valkenberg Homestead) and the Gateway Park development on land formerly owned by the Medical Research Council.

- Very Unfavourable (D). Refers to small (less than 1 ha) units of land, privately owned and mainly used for residential purposes. It also includes 'fixes' such as roads, though these are not mapped. Maitland Garden Village and the Berkley Village residential and commercial areas are rated in this way.

5.4.3.2 Comments

This land-use/landownership section proceeded from the view that the CA is an extremely strategic tract of land and that, as such, optimal land-use is of paramount importance. Had the CA been located elsewhere, further away from the city centre, that might not have been the case. As a consequence, this analysis has taken a ruthless view of under-utilisation, obsolescence and inappropriate location and linked this with a proactive advocacy which promotes land-use changes on the basis of the ease with which these changes can be made. The factors determining this are the size of landholdings and private as opposed to public landownership.

This progressive approach has produced a situation where very few areas are deemed unfavourable for development. Only two areas are rated as very unfavourable for (re)development, *viz*. Berkley Village and Maitland Garden Village, and a further three - Vincent Pallotti Hospital, the Gateway Park development, and the UCT Courtyard development/Valkenberg Homestead precinct - are unfavourable for development. (This assumes the completion of current developments by UCT and at Gateway Park.) The remainder of the

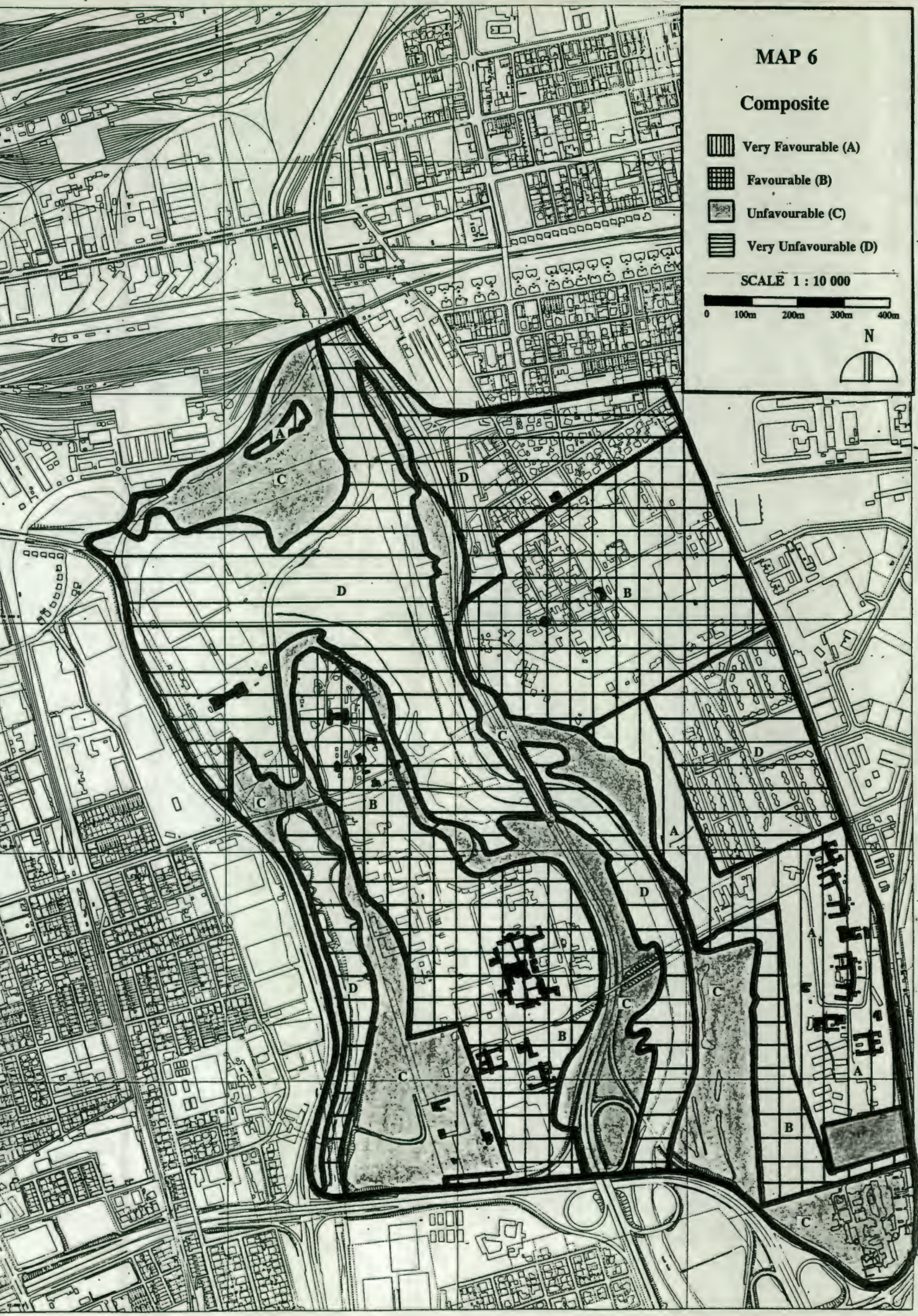
site is deemed favourable for (re)development, with the Liesbeeck Sportsgrounds, the Peninsula Golf Driving Range, and Valkenberg eastern campus, all rated as very favourable for new development options.

5.5 Composite Evaluation

The purpose of this report is to demarcate two planning areas within the CA, one fit for (re)development and the other not. In the language of overlay methodologies, that is to distinguish crucially between areas (very) favourable to development and those that are (very) unfavourable. The composite map (see Map 6) depicts these four categories, but requires added interpretation if it is to be a useful aid to planning. There are consequences for land-use depending on the ratings and these need to be highlighted and clarified.

Firstly, it should be noted that the historical overlay has been only partially incorporated in the composite overlay. The historical overlay indicated precincts and their relative (un)favourability for development. In reality, however, planners recognise that buildings are not a major constraint on land-use as their use can readily be changed. Therefore, the composite overlay simply indicates buildings of historical significance which must be physically maintained and retained, but which says nothing about land-use *per se*. Ultimately it is the flooding and land-use/landownership factors which inform the composite map.

Section 4.5 specifically defined the suitability rating system and what the implications of land being rated in a particular way would be. The broader implications are repeated here. In areas rated as very favourable or favourable, the implication is that some form of development is acceptable. There are very few environmental factors preventing this and, indeed, some form of new land-use would optimise land-use efficiency. This new land-use would probably not be open space, given the conventional development pressures in Cape Town and the fact that unfavourable areas could most likely be used in this manner. The bottom line is that (new) development is acceptable in these areas and that land-use changes might be advisable in currently developed areas. These areas are:


MAP 6
Composite
Very Favourable (A)
Favourable (B)
Unfavourable (C)
Very Unfavourable (D)
SCALE 1 : 10 000
0 100m 200m 300m 400m
N

Very Favourable (A)

- Peninsula Golf Driving Range
- Valkenberg eastern campus
- An elevated section in the north of the Liesbeeck Sportsgrounds

Favourable (B)

- Most of the SAAO
- Most of Valkenberg western campus
- Most of ACARC
- A strip of land between the Pallotti wetland and the Valkenberg eastern campus

Some of these findings will probably be viewed as contentious, particularly those which designate the land occupied by such hallowed institutions as Valkenberg Hospital, ACARC and the SAAO, as suitable for (re)development. This should not be misconstrued as a pro-development bias, but rather as an indication that these and other areas stipulated above, *could* easily be redeveloped, that there are few geographic constraints and that it would be relatively simple to implement. That does not mean they *should* be redeveloped. 'It does not follow that, because an area is well-suited to a particular activity, it should necessarily be reserved for that use' (Flaherty & Smit, 1982, p. 327).

In those areas rated as unfavourable or very unfavourable the implication is that no further development (in the conventional sense) should take place. Those areas which are currently undeveloped should remain that way, i.e. as open space, while already developed areas should also be left largely as they are, though limited land-use changes in exceptional, unforeseen circumstances might be countenanced. These areas are:

Unfavourable (C)

- A narrow strip of land set back from and parallel to the Liesbeeck and Black Rivers
- The far northern sector of the Liesbeeck Sportsgrounds

- The UCT Courtyard- and Gateway Park- developments

Very Unfavourable (D)

- The area, mostly owned by the CCC, within the 5 year floodlines
- Liesbeeck Sportsgrounds
- Berkley Village
- Maitland Garden Village

In effect, therefore, all areas below the 50 year floodlines; Maitland Garden Village; Berkley Village; and the two current developments, once completed, are not suited to further development, while the remainder of the CA is. This demarcation provides the skeleton for a structural framework within which more precise land-use can be investigated, but before this framework can be approved, a number of non-mappable issues must be considered.

CHAPTER 6

Key Considerations for Land-Use in the CA

6.1 Introduction

Chapter 5 examined the geographic factors within the CA and demarcated areas suitable for development or non-development. That demarcation, however, was derived without a wider understanding of the contextual function of the CA in the Cape Town Metropolitan Area (CMA), nor with much appreciation of an array of socio-economic and political forces which should inform land-use planning within the study site. As Vanderhoef (1990) has shown, land-use planning must consider what is physically possible, but also what is desirable, approvable and marketable, the latter based on demand for land-use. Forces of this nature, as was pointed out earlier, cannot be accommodated by the overlay method and it is the task of this chapter to investigate some of these intangible influences before a final set of conclusions can be proffered.

6.2 Conservation and Development

Sustainable development policy aims to achieve a balance between conservation and development and is one of the underlying principles of IEM (Department of Environment Affairs, 1992). Cape Town planners need to weigh up the demand for development and conservation at a metropolitan level and employ that knowledge in devising a land-use plan for the CA. Conservation areas (and open space in general) are regularly undervalued and it is up to planners to internalise the positive externalities flowing from open space and to make a case for its retention. In this way planners can integrate conservation and development, thereby complying with the principles of sustainable development.

The CA represents a perfect microcosm of the development versus conservation/open space debate in that both options, and an integrated, environmentally sensitive combination thereof, are still available in large portions of the area. There are valid arguments in support of all three combinations. Within this debate there is another one as to the most appropriate form of open

space, i.e. protected, natural, relatively inaccessible open space (e.g. Table Mountain) representing the conservation end of the open space spectrum, as opposed to urban landscaped parkland at the other extreme. Clearly, there is also a range of options in between. In this regard it is worth noting that there is virtually no natural (indigenous) open space within the CA and that, should this land-use be favoured in places, the former naturalness of the area will have to be regenerated.

Some urban areas, by general agreement, are best left as open space. For example, places not barred to the public, but having little or no direct use, such as road edges and highway interchanges, have greatest advantage when used for habitat creation (Hough, 1984). However, the urban balance between development and open space cannot be left to chance and there are a number of policies which specifically address this question in the CMA. Some of these policies are examined below with a view to gauging current planning thinking and intentions as regards the desired land-use balance in the CA.

6.2.1 Conservation and Development: Policy Directives

There are open space policies issuing from national, regional and metropolitan authorities and which are relevant to a discussion of open space in the CA. Unfortunately, these policies can be contradictory and rarely are prepared to make any concrete proposals, and as such they are not always that helpful. However, as the following discussion indicates, there is a tenor shared by these policies which suggests the degree to which open space in the CA might be valued.

At a national level the Council for the Environment (1988) recommends that key ecological features (streams, wetlands) be protected and that open space be exploited for its recreational and educational value. Both the Cape Metropolitan Area Guide (CMAG) Plan (1988) and the Interim Metropolitan Development Framework (IMDF) (1993), which will be the basis of decision-making for urban development until 1995/6, include conflicting principles which are not all that helpful. They recognise the need to protect the natural assets of the CMA, but also propose the containment of urban sprawl and a more compact, higher density urban structure. More specifically, though, the CMAG Plan designates the area either side of the Liesbeeck and Black Rivers as open space, recommends no development within the floodplain and suggests that the area currently occupied by the RBS be declared a Protected Natural Environment (PNE).

In a separate study, Low (1991) identified the RBS as one of the top 25 conservation priorities in the CMA and notes that because of its location and accessibility, it could be used for educational purposes.

The IMDF is a layered framework and one of its components is a Metropolitan Open Space System (MOSS). This designates the confluence area proper as open space, confirming the CMAG Plan's assessment. The Greening The City Report (1982) is not as convinced of the conservation status of the CA; the report's main achievement is the creation of the Coast-to-Coast greenway, but it views the RBS and the Black River as low priority components of this Greenway. However, this is a fairly dated policy document and perhaps not as relevant as others.

Finally, the Proposed Guidelines for the Release of Public Land (Urban Development Commission, 1993) propose that land should be used for the primary purposes for which it was originally intended, unless these purposes are no longer required. In other words, open space in the CA should be retained and well-utilised developed areas should also remain unaltered.

There is, however, an opposing view, as expressed by Dewar and Watson (1980). They question the modern contention that cities are getting too big and propose that, on a national scale, this amounts to more efficient land-use. Larger cities benefit from economies of scale (even if they are dysfunctional in some ways) and are engines of economic growth, especially in developing countries. Cape Town is one of three major growth cores in South Africa and perhaps it unrealistic to restrict development in favour of environmental concerns within the CMA.

Aside from the preceding and now somewhat dated objections, a level of consensus is evident in the remainder of the policies. It points to open space within the floodplains and the option of further development where development has already occurred. Although boundaries are not and cannot be clearly defined by policies, there is a remarkable degree of congruence between what these policies suggest and the results of the overlay evaluation.

6.3 Culemborg-Black River Effects

As part of a national rationalisation exercise, Transnet and the South African Rail Commuter Corporation (SARCC) are examining the most profitable way of releasing (for development) up to 300 ha of prime land in the C-BR area, immediately to the northwest of the CA. This is prized urban land and will be the focus of what might be the biggest urban development in Cape Town this century. Clearly, it will have significant impacts on decisions pertaining to the CA. In this respect, C-BR development could have one of two outcomes for the CA:

- provide an over-supply of commercial/retail/light industrial space, relieving development pressure on the CA; or
- act as a catalyst to further development in adjacent areas, by attracting investors to the area.

One of the most significant features of the C-BR is that it has been entirely disturbed and it is therefore very likely that in the future the area will be given over to development. There is little opportunity for the large scale re-creation of open space. That makes open space within the CA a relatively rarer commodity and adds weight to the argument for retaining it.

One thing that is certain, is that if new large scale development is to occur anywhere within 10 km of the Cape Town CBD, then it will happen in the C-BR before the CA. And as Harvey (1985) has shown, there is a wave-like pattern of investment in the built environment in capitalist society, often requiring between 10 and 30 years to successfully regenerate/redevelop an urban area of the size of the C-BR. This suggests that planning for the CA is less of a priority than it is for the C-BR and that a moratorium on further (built) development within the CA could be justifiably imposed. I&APs have already suggested precisely that. In effect that will imply that existing open space could be examined with a view to optimising its use, given the proviso that it remains open space in one form or another. It also means that no irreversible environmental damage will have been done and that the option still exists to build/develop should a future plan recommend that. This accords with the concept of intergenerational equity espoused by IEM sustainable development. In the interim, open space in the CA should be preserved (and improved and its accessibility enhanced).

6.4 Accessibility

In the Greening The City Report (1982), one of the major aims is to establish a more visible and accessible open space system. Urban trails will be one way of doing this. In another paper, Corin (1991) stipulates that floodplains should always be accessible to the general public. Though not specifically raised as an issue by I&APs, the inaccessibility of the CA is implicitly highlighted in statements relating to the under-utilisation of and desire for more recreational facilities in the area.

Accessibility is one of the five criteria which Lynch (1981) uses in the evaluation of planning, confirming the view that the evaluation of geographic factors on their own is not good planning practice. Access can relate to many different things - people, activities, resources, places - but in more developed countries the emphasis is increasingly on access to particular landscapes (Lynch, 1981). This is precisely what is denied the public by most of the CA. It is rather ironic that, from the metropolitan perspective, access to the CA is good - it is served by an excellent transport infrastructure - but that at the same time 'micro' access into and across the site is very poor. It functions as a barrier to east-west movement (there is only one public path across the site and no public roads) in much the same way as the C-BR limits movement from the Southern Suburbs through to Table Bay. It is also something of an indulgence that for the relatively few people who work or are treated there, the SAAO and ACARC are 'too' accessible, when accessibility is not a prerequisite for their location. This amounts to a re-statement of the locational obsolescence discussion (see section 5.4.3).

Access is so important for land-use planning that it is frequently cited as one of the key variables in site differentiation (Wilkinson, pers comm). The edge conditions of a given site can range from hard/impermeable through to soft/permeable. Within the CA, the Black River Parkway constitutes an impermeable barrier and effectively splits the area into two. Edge conditions are fairly impermeable, either as a consequence of certain features such as roads (Liesbeeck Parkway, N2) or rivers (Liesbeeck), or because access is forcibly restricted, e.g. into Valkenberg Hospital, Liesbeeck Sportsgrounds and ACARC. Within the site, access is restricted in a similar manner, as is the case with the SAAO and the RBS.

That various institutions restrict access is hardly surprising; for some of them it is the key to their efficient functioning, e.g. Valkenberg Hospital and the wetlands of the RBS. 'Achieving wide access to wanted features while preserving.....control requires some agility in shaping the physical and institutional pattern' (Lynch, 1981, p 200). In that sense, it might simply not be practicable to allow unrestricted access to sensitive wetlands as that might lead to their wholesale degradation. However, it should also be acknowledged that the ability to exert control over access is valued in itself and can be no more than a form of preserving privilege. At the same time it should be conceded that controlled access in much of the CA - Valkenberg Hospital employs a security company - has curtailed security problems and prevented illegal squatting in the area, allaying the fears of many I&APs.

Although there is some justification for it, it should be clear that many parts of the CA are inaccessible and that, especially on publicly owned land, the public might reasonably expect this situation to be redressed. Open space can be preserved exclusively for its ecological significance, but particularly in an urban setting, one would expect that the public should be afforded the opportunity to utilise such open space. Perhaps there is a case for setting standards of minimum access to various facilities/areas within the CA?

6.5 Zoning

Zoning is more of a system of control than a planning method, yet it will obviously strongly influence any land-use planning exercise. Once an area has been zoned, certain costs or benefits accrue to the land and these can be capitalised and reflected in land values (Fischel, 1990). This amounts to interference in the market for land (which can be desirable - see section 3.2), but it is also recognised as an inflexible approach, often stifling the dynamic interaction of urban living. The CCC planning department has sought out a more adaptable form of land regulation, hence the use of the package of plans approach in the C-BR.

The land in the CA is currently zoned for a number of uses/activities. (See Appendix 2 for a comprehensive list of current zoning within the CA.) Without going into detail, it is clear that current zoning acts as a constraint on future land-use. However, four points are significant.

Firstly, that the CCC now favours the package of plans approach, suggests that zoning is increasingly discredited and, therefore, zoning decisions are open to revision. Secondly, there are procedures in place for rezoning so that current zoning need not be viewed as immutable. Thirdly, the CA is zoned into relatively few, large, prescribed land-uses and only a few decisions would have major consequences for the entire area. The last point is that the CCC would probably not be undertaking a land-use planning exercise for the CA if it did not believe that it had the political muscle to impress a new planning regime upon the area.

A tentative conclusion would be that, though current zoning is a constraint, particularly for developed, privately owned land, it should not be viewed as insurmountable and new land-uses can be considered irrespective of current zoning.

6.6 Current Developments

Until recently, few major developments had taken place in the CA. Those that did were mostly aimed at improving or expanding facilities on land already owned by the developers, e.g. the extension of Valkenberg Hospital. However, in March 1990 1.6 ha of land belonging to Valkenberg Hospital was transferred to the Medical Research Council, who subsequently invited development proposals. The Gateway Park development on this property was approved by the Administrator in December 1993, although the rezoning application is not yet through. Similarly, UCT acquired 2.4 ha of land from the Department of Community Health in March 1991 and construction of the Courtyard development commenced in March 1994. The Valkenberg Homestead 'werf' is the focal point of this development, which is expected to provide executive accommodation for the next 20 years, when UCT finally takes 'delivery' of the project.

To a large extent this study has accepted both developments as *fait accompli*, regardless of the merits of either project. Both, however, were the subject of not inconsiderable public opposition and raised a number of issues, key amongst these being the equitable disposal of State land. I&APs were also concerned that these developments might set a precedent for further development in the CA, though others welcomed this as they were perceived as setting the

correct tone for new development. Others pointed out that the CA will have to start generating income to cover its own maintenance costs and that a combination of private and public use is the best way of achieving this: private developments could subsidise public open space. A valid criticism is that neither project was open to public scrutiny and that no meaningful EIA was conducted before construction of the Courtyard development commenced.

This report largely avoids this debate, but recognises that these two developments might have benefited from lack of disclosure. The I&APs views relating to future development in the CA - see the next section - become more significant in this respect.

6.7 I&APs Concerns

Over 60 I&APs were consulted during the baseline study, mostly on the basis of their representativeness. These included: landowners; local communities; State and local authorities; regional and metropolitan community representatives; and NGOs and environmental groups. They expressed a multitude of concerns, many of which have been threaded through this report mainly to provide a social perspective on a particular technical observation. It would be a report in itself to examine the various views espoused by the I&APS and in this section only those issues which might have a very direct bearing on a land-use decision are highlighted. At times this means concentrating on areas of consensus and taking those as a prompt for action; at others it means highlighting areas of disagreement, which decision-makers will have to address more carefully before reaching decisions.

- I&APs believe that the CA offers a number of land-use opportunities and that the area to date has been under-utilised. This is a manifesto for planned change.

- There is a debate amongst I&APs regarding the efficiency and appropriateness of current land-use; the focus, in this respect, is on Valkenberg Hospital, ACARC and the SAAO.

- Open space is highly prized by most I&APs and should be retained wherever possible, while a moratorium on development should be declared, pending the formulation of a coherent development plan for the CA.

- Flooding was identified as a problem in the study area and proposed measures to control flooding (e.g. canals, channels and retention ponds) demand sensitive analysis before a decision to implement them is taken. Improved river management is required.

- Almost any land-use is conceivable in parts of the CA, except for heavy industry which is viewed as wholly inappropriate.

- The proposed extension of the RBS should proceed.

- The land-use decision-making process must be of a participatory and transparent nature.

This last point is a procedural one and is further examined in the next section.

6.8 Decision-Making and IEM

The purpose of EIAs is to facilitate better decision-making and planning of developments (Department of Environment Affairs, 1992). Fuggle (1992) expands on this and posits that EIAs should also provide decision-makers with objective information about the environmental consequences of the implementation of plans so as to enable them to reach the most beneficial decision. In practice, this frequently requires that a number of alternatives are presented to decision-makers, but that route makes less sense in this CA study which is only a preliminary planning exercise not recommending any particular projects. It is more important that a rational decision-making process is employed in this instance, one which entails 'logical reasoning shared independently by many observers, i.e. not necessarily valid, but nor is it idiosyncratic or wholly subjective' (Caldwell, 1987, p 303).

IEM caters for the unavoidably subjective nature of decision-making by insisting that the entire process is transparent and accountable. The CCC planning department must be made to account for the decisions that are finally taken with respect to land-use in the CA. This notion is given added weight by virtue of most of the CA comprising public land, in which the public has a very legitimate interest. To address the possibility of inappropriate decisions, IEM makes explicit provision for a framework of review (Department of Environment Affairs, 1992d). This allows

for both public and peer review of an EIA and of any (premature) decision and, although a time consuming undertaking, ultimately produces a higher quality of decision-making.

There are a number of sources of potential disagreement about land-use decisions in the CA. One of these is procedural and concerns public involvement. It is believed that this has been largely circumvented in this study by the timely involvement of I&APs in the evaluation process. It is a principle of IEM that I&APs should be involved from the initial proposal/design stage and not consulted only once the project has commenced. The other source of disagreement, one reflected even at an intra-I&AP level, is a potential clash of values. Portney (1992) identifies five potential value clashes and the one most pertinent to the CA concerns the role of nature in society. In essence, the decision-makers' attitude towards the concept of sustainable development, i.e. the balance between development and conservation, will heavily influence the final decision.

It is inevitable that land-use decisions will not please everyone interested in the CA. However, as long as the decision optimises benefits and follows the sort of procedure described above, then most parties should be willing to abide by that decision.

6.9 Conclusion

This chapter has highlighted the fact that, although there are certain geographic factors which are the primary determinants of land-use (as discussed in chapter 5), there is also a set of considerations providing the framework within which these factors should be assessed. Therefore, for example, decision-makers will have to weigh up the often conflicting demands of conservation and development in reaching a land-use decision, a conflict for which there is no one correct answer. The other considerations examined are similarly elusive, and it is only by adopting a transparent decision-making procedure, that most I&APs will accept whatever decisions are taken.

The issues raised in this chapter are 'blended' with the development and no-development zones identified by the composite overlay in chapter 5 and together inform the conclusions, recommendations and guidelines of the final chapter.

CHAPTER 7

Conclusions, Recommendations and Guidelines

7.1 Introduction

This chapter draws the entire study together and, in the conclusions section, makes a final pronouncement in regard to the most appropriate areas within the CA for either development or non-development/open space. Given that rudimentary strategic framework, however, there are still a number of factors which planners will need to take into account. The more generalised and insistent of these are incorporated in this chapter in the form of recommendations, while the guidelines are of a more specific and responsive nature and are less likely to materially alter land-use plans.

The decision to act on these conclusions and recommendations hinges entirely on the political will of planners and other decision-makers concerned with urban development in the CMA. As an OECD (1990) policy paper has noted, successful urban rehabilitation depends on the preparation of a supportive local plan, the commitment of sufficient resources, and public authority initiative. Most of these ingredients appear to be in place, but it is important that the momentum of interest is maintained so that the best land-use decision for the CA is taken.

7.2 Summary

This dissertation is part of a process; it began formally when the CCC recognised the need for a master plan for the CA. In terms of this dissertation, the collection and synthesis of baseline data during the first three months of 1994 was the first step in the process. It has been the task of this study to evaluate the data presented in the baseline document and, on that basis, to proffer conclusions which will optimise an imminent land-use decision for the CA.

In order to pitch the conclusions at an appropriate level, it was first necessary to examine the CA in greater detail, particularly as regards its urban function and the role it serves in the

metropolitan context. Thereafter, a thorough analysis of planning ideology and theory, and its application within the CMA, indicated that guidelines informing a high-resolution land-use plan would be inappropriate at this stage. A second-tier development framework plan was chosen as the level of planning detail appropriate to this dissertation.

Upon careful reconsideration, this study concurred with the preliminary assessment of the baseline document and concentrated on those environmental controlling factors pinpointed in that report. The geographic (mappable) factors were split into primary and secondary factors. The secondary factors were examined in moderate detail, while the primary factors were extensively investigated in a series of overlays (the chosen technical method of this dissertation). However, the geographic factors do not exist in a vacuum and the (social) issues which might temper the spatial configuration they dictate, were analysed next. The conclusions, which follow, bring together all these factors at a level which will meaningfully inform a framework for land-use planning in the CA.

7.3 Conclusions

The CA is strategically located only 5.5 km from the Cape Town CBD and is under intense pressure to be more effectively utilised. Planning policy for Greater Cape Town has recognised the need to contain urban sprawl and to promote higher density (residential) development, but also acknowledges that open space serves extremely important, if less quantifiable, functions in the urban environment. Given these pressure, the *laissez faire* approach, which has characterised past management of the CA, is becoming increasingly untenable. I&APs are insistent that a coherent plan for the CA be devised as a matter of urgency. The CCC planning department has reached the same conclusion and this study will partially inform a major land-use plan which the planning department is currently engaged in formulating for the CA.

In the adjacent C-BR area, the CCC planning department has adopted the package of plans approach, preferring it to a less flexible zoning exercise. For a number of reasons this study employed the same approach, which will have the advantage of providing a contiguous second-level development framework linking the C-BR and the CA. To that end, this study differentiates between those areas suitable for (re)development and those which are not; it does

not zone areas for more specific use, e.g. general, commercial, community facilities etc. (Re)development is not a simple concept and in this study it is taken to mean a change of land-use on open space or presently developed land, usually, but not invariably, requiring new construction.

As has been noted earlier, the fact that certain areas are designated as suitable for (re)development is an indication of what is possible - that they could be developed - and not necessarily a call for development in those areas. In terms of the package of plans approach, this dissertation suggests only a second level framework and there might be valid arguments, departing from the main conclusions, in order to make detailed planning more practicable. For example, it would be naive to presume that a conventional development zone would not make allowance for open space within its boundaries.

In this study the evaluation was split into two components, the first of which comprised an analysis of geographic factors, key factors being presented as overlays, and the second of which was a less technical assessment of various factors which might 'temper' the purely geographic evaluation. The combination of these factors led to the conclusion that the following areas were either favourable or very favourable for (re)development, listed in suggested order of favourability.

- Peninsula Golf Driving Range.
- Valkenberg eastern campus.
- The strip of land between the Pallotti wetland and the Valkenberg eastern campus.
- Those parts of the SAAO, ACARC and Valkenberg western campus lying above the 50 year floodlines.

Areas which should either be left in their present developed state, have current development proposals or plans completed or be exploited as better managed open space are (in no particular order):

- All areas below the 50 year floodlines (best given over to open space).
- Liesbeeck Sportsgrounds.

- UCT Courtyard- and Gateway Park -developments (once current schemes are completed).
- Vincent Pallotti Hospital (left in present state).
- Berkley Village and Maitland Garden Village (left largely intact, though allowing for possible upgrading).

The distinction between these two land-uses and their most appropriate locations are the key findings of this report. However, there are a number of factors which should be considered before unreservedly accepting this schema and these qualifications are set out in the recommendations and guidelines sections which follow.

7.4 Recommendations

There are a number of recommendations which need to be appended to the main conclusion of this report; some of these have become apparent through the analysis undertaken in the baseline study and this report, while others have been raised by I&APs. The recommendations are listed below, together with a brief discussion of each of them.

- The CCC planning department should act upon the main conclusion of this report and declare development and no-development/open space compartments within the CA. As a matter of course, some simple system will need to be created to ensure compliance with this declaration.

- A short-term moratorium on further development, excluding the UCT Courtyard- and Gateway Park -developments, should be decreed. This moratorium should apply until the conclusion of the C-BR study at which time it could be reappraised. Such a moratorium would, by default, have the effect of valuing the preservation of open space over development, but it should rather be seen as an interim holding measure which includes within it the option of future development. It should also be stressed that a moratorium on development is not a moratorium on planning (for development) and that provisional plans can be formulated on the basis of the identified development and no-development zones.

- A study into the demand for strategically located urban land should be commissioned.

Planning is not only about what is possible, but also what is feasible and required, yet very little effort is devoted to the assessment of the demand for land (uses).

- With a better understanding of the demand for land, the third- and fourth-tier plans stipulated by the package of plans approach can be formulated. This will be the task of professional planners (not of environmental scientists, although they should be involved in evaluating impacts of development plans) and should designate more precisely the types of land-use within the CA, given the proviso that they are compatible with the second-tier recommendations of this study.

- The broad principles of this IEM should be employed throughout the planning process. The process should be open and participatory right through from the proposal to decision-making stages and decision-makers should be made accountable to the public.

- A separate river management study, focusing particularly on flooding and measures to manage it, needs to be undertaken. It would be premature to decide on unsightly canals or channels when other options do not appear to have been fully investigated and when there is still significant public concern about these engineering solutions.

- In deference to public opinion, and noting the strategic location, proximity to residential areas and relative ecological sensitivity of parts of the CA, heavy industry should be excluded from the area. It should not be one of the options explored in the fourth tier planning recommended earlier.

- The RBS should be extended as proposed, particularly southwards along the Black River to the N2 boundary of the CA. New land incorporated into the RBS would comprise roadside verges, interchanges and wetlands, all of which are not well suited for many other land-uses.

7.5 Guidelines

The guidelines differ from the recommendations in that they are more reactive in nature and don't seek to dictate development-related decisions. Different guidelines will be appropriate for

every proposal made in the CA and the list below is intended, as it must be, to be generic in its composition.

- Each development proposal in the CA should be submitted to an EIA. For smaller projects, and assuming compliance with the recommendations as above, preliminary EIAs might suffice, thereby avoiding the often excessive costs and delays increasingly associated with impact assessments.

- Inaccessibility and under-utilisation of much of the CA is a major concern. Planning should redress under-utilisation, but a general guideline for the area should be that mechanisms which afford better access to the site should be considered in all future developments. (At the same time, it must be acknowledged that private landowners do have the right to exclude the public.)

- The area is presumed to be of archaeological significance and provision must be made for archaeological digs prior to the commencement of new projects.

- The two rivers in the area, especially the Black River, are severely polluted and although water quality has improved in the last five years, it is unlikely that, in the foreseeable future, it will improve to the point where water-contact sports are permitted. These levels of pollution will need to be borne in mind in deciding future land-use in areas adjacent to the rivers.

- The CA falls within a declared smokeless zone and, unless overturned, that will have implications for, and constrain development.

- Noise pollution is a potential constraint along the Black River Parkway and the N2 and mitigating measures will probably have to be considered to alleviate this problem if certain forms of development are favoured.

7.6 Postscript

This dissertation has attempted to satisfy the demands of three different disciplines (or approaches), *viz.* IEM/EIA, environmental planning and urban planning. The imprint of IEM

is best reflected in the procedures adopted, while environmental planning should be detectable in the forward incorporation of environmental opportunities and constraints in the planning process. This can produce tensions between environmentalists and urban planners, and the concerns of the latter group have been met primarily by means of adopting the package of plans approach. The integration of these different discourses has many advantages, but can also prove limiting and discourage contemplation of any grandiose recommendations.

In this regard, it would be instructive to 'fly a few kites'. The I&APs, for example, on balance had a rather cautious vision for the area, generally maintaining that the CA should be a mixed-use area, with the emphasis on preserving open space. Some believed that the entire CA should be given over to open space. In terms of theory, progressive thinking increasingly favours a 'green' approach to urban planning. Thus: chaotic, uncontrolled growth is being reined in; alternative forms of transport are being promoted (e.g. public transport, walkways and cycleways); integrated, mixed-use, relatively self-contained urban units are preferred; the preservation of water bodies is prioritised; and the increased recognition that constructive rural planning, providing job opportunities beyond the city limits, contributes to more environmentally friendly urban environments (Lowe, 1991). This is not conservation for conservation's sake, but hinges on the pursuit of humane living environments. Even urban agriculture is making a comeback in developed countries, at a time when the Cape Flats vegetable bowl around Philippi is being touted for development.

This current thinking might also colour a land-use decision for the CA and some of the examples above, and many other green proposals, should not be summarily dismissed, but seriously entertained in a bid to arrive at the optimal, sustainable and equitable use of the CA.

ABBREVIATIONS

asl	above sea level
ACARC	Alexandra Care and Rehabilitation Centre
C-BR	Culemborg-Black River
CBD	Central Business District
CCC	Cape Town City Council
CMA	Cape Town Metropolitan Area
ha	Hectare
I&APs	Interested and Affected Parties
IEM	Integrated Environmental Management
IMDF	Interim Metropolitan Development Framework
M.Phil	Master of Philosophy
MOSS	Metropolitan Open Space System
pers comm	Personal Communication
SAAO	South African Astronomical Observatory
SARCC	South African Rail Commuter Corporation
UCT	University of Cape Town
WCEDF	Western Cape Economic Development Forum

GLOSSARY

baseline information: the totality of all relevant information (gathered in the baseline document) 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 consumption to avoid irrevocable depletion, usually of natural resources.

conventional development: a mode of development including the construction of built structures.

environment: includes both the biophysical and socio-economic elements, i.e. a broad definition as favoured by IEM.

geographic: those environmental elements which are physically recognisable, including the biophysical and built environment.

land-use planning: the demarcation of land for specific uses, usually (but not necessarily) over an extensive area, based on environmental criteria, and which takes into account present and projected future needs.

metropolitan: refers to the greater Cape Town agglomeration of municipalities and other local authorities.

open space: refers to land that has not been built on (e.g. vleis, rivers, wetlands, mountains, street verges and other undeveloped and vacant land) and, less frequently, to derelict urban wasteland.

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.

public land: land owned and administered by public bodies, from local authority level to central government.

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.

Valkenberg Homestead: also known as Valkenberg Manor House or Valkenberg Main House.

zone: land set apart by a regulatory planning scheme, irrespective of whether it comprises one or more land units or part of a land unit.

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APPENDIX 1

Study Team

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APPENDIX 2

Land-Use: Landownership: Zoning in the CA

Berkley Village Commercial: Private: General Commercial

Berkley Village Residential: Transnet and Private: General Residential

ACARC: Department of Community Health and Welfare: Community Facilities

Maitland Garden Village: CCC and Private (being transferred): Subdivisional Area and Public Open Space

Peninsula Golf Driving Range: CCC: Single Dwelling Residential and Public Open Space

Valkenberg Hospital: Department of Community Development (DCD): Community Facilities (western campus) and Undetermined (eastern campus)

Gateway Park Development: Medical Research Council: General Commercial

Vincent Pallotti Hospital: Private: Community Facilities

UCT Courtyard Development: Private (and a small section leased from DCD): General Business

Valkenberg Homestead: National Monuments Council: General Business

SAAO: Foundation for Research Development: Community Facilities

Liesbeeck Sportsgrounds: Transnet: Community Facilities

Liesbeeck Sportsgrounds North: Transnet/SARCC: Community Facilities

Raapenberg Bird Sanctuary: CCC: Community Facilities

Remainder of CA (between Valkenberg eastern- and western- campus, and abutting the Liesbeeck River): CCC: Public Open Space

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