THE CONSERVATION WORTHINESS OF THE ENVIRONMENT OF THE BLACK AND LIESBEEK RIVER CONFLUENCE AREA

By

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EXECUTIVE SUMMARY

INTRODUCTION

This dissertation aims to **interpret** the **environmental factors** which will inform land use planning for the Liesbeek-Black River Confluence Area. It is in partial fulfilment of the academic requirements for a Master of Philosophy (M.Phil) in Environmental Science through the Department of Environmental and Geographical Science (ENGEO) at the University of Cape Town (UCT).

This document follows on from the Baseline Information Document (BID) produced by the 1994 Masters students and should be read in combination with that document. This dissertation uses the information provided in that document, and with the support of other materials and insights, draws conclusions for the most appropriate land use for the study area.

A Statement of the Problem, the Aim, Approach and Philosophy adopted towards the Study Area in this Dissertation.

The **problem** is perceived to be the substantial public objection to recent proposed developments in the study area. These objections have revolved around the method of disposal of State land, the fragmentation of public open space and the apparent disregard of the authorities for the natural historical legacy of the Cape Peninsula.

The **aim** of the study is to demonstrate that the study area holds potential as a public amenity. This could be self supporting and of benefit to future generations in the region and is therefore worthy of conservation.

The **approach** adopted in this dissertation is that the study area is unsuitable for any use other than as a conservation and recreational reserve. This could prove its value

in a substantially more populated and informed future Cape Town. Urban open space, which constitutes wildlife habitat, is required locally to meet increased human population habitation needs. This need is perceived to be global phenomenon. There is concern that the accumulated consequence of these local demands, will result in a profound negative effect on the Biosphere.

PUBLIC CONSULTATION

Recent developments in the study area have indicated that certain interest groups have clear ideas of privatised development for the area, while others wish it to remain State controlled. Yet another group wishes to see it come under more local public control. The results of the **Public Consultation Process** (PCP) conducted for the purposes of the BID are summarised in the dissertation.

The opinions of the participants in the public consultation process are then applied throughout the dissertation wherever they are applicable.

APPLICABLE THEORY, POLICIES AND PLANS

Different approaches to an analysis of the area are possible. These are discussed and potential scenarios are identified. The approach adopted in this study closely follows the principles of the Metropolitan Open Space System (MOSS), which is a linked and integrated system of open space within a city. These principles are contained in the "Planning of Metropolitan Open Space" (1994), and the Council for the Environment's, "Guidelines for Natural Open Space in Urban Areas" (1989), which are reviewed. These documents provide planning principles and guidelines which can be used when assessing open spaces within an urban setting. These include ecological, recreational, aesthetic, noise, education, financing, research and planning principles.

It is shown how the study area meets the criteria provided by the documents and these are applied in the assessment.

Existing metropolitan and local **policy plans** are assessed at three levels, namely, metropolitan, peripheral and site specific. It is concluded that these documents identify the study area as a major element in the provision of recreational facilities, both passive and active, open space and greenbelt functions. It is therefore recommended that alternative sites for the densification of the city first be exhausted before consideration is given to developing the study area. This will allow inter-generational equity to be accommodated.

A general discussion on open space standards, which aim to ascertain the open space needs of a given community, is included. It is found that meaningful open space is presently inadequate for the surrounding urban areas. Densification, which is a process aimed at arresting urban sprawl by increasing the carrying capacity of existing urban areas, and the suitability of the study area for meeting the housing needs of an increasing urban population, are also discussed.

It is concluded from the relevant policies, that due to the natural features of the study area, the densification needs are better met by retaining current use and supplementing this with a recreational emphasis for a densified city.

THE STUDY AREA

The study area is assessed in terms of its physical, biological, historical, demographic and recreational characteristics.

An assessment of the **physical environment** in terms of its topography, pollution, soil composition and other relevant elements is made. This reveals that a number of factors limit land use options in the study area. Of greatest significance is that 104 ha, or nearly 45% of the study area, consists of rivers, and falls within the 1:50 year flood

plain. Of significance is the fact that the area has existing institutional uses for medical (Valkenberg, Vincent Pallotti and Alexandra Hospitals) and scientific (South African Astronomical Observatory) purposes. These institutions represent 37% of the study area. Also of importance is that much of the study area is a declared Bird Sanctuary and there are proposals to have this Sanctuary extended. Currently the Bird Sanctuary occupies 6.5% of the study area, while a further 32% of the study area, being mostly the river courses, is proposed for incorporation into this Bird Sanctuary.

From a **biological** perspective, the area contains 121 species of avifauna of which 3 are red data species. It also supports a number of species which are declining in the southwestern Cape due to the depletion of wetland habitats. The rich diversity of avifaunal species in the study area is attributed to the current low density institutional use, which surrounds the core wetland areas, thereby providing an effective buffer zone and terrestrial habitat.

Avifauna is acknowledged as the most conservation worthy component of the study area and a sensitivity map is provided which indicates their habitat preferences. The importance of terrestrial birds for species diversity is highlighted. This dissertation illustrates how the demands of succeeding human generations have impacted on the natural system of the area.

The Confluence Area is of National **historical importance** having three declared Monuments and several potential monuments, sites and collections of buildings within it. Because of these numerous sites of archaeological and historical significance, a thorough examination, from this perspective, of the area, would be a prerequisite to any changed land use.

Demographic information indicates that the study area is contiguous to high-density residential areas. It is also close to the Central Business District (CBD) which already provides most of the employment opportunities in the region. It is therefore recommended that other areas, currently lacking job opportunities, be targeted for the

types of development that would generate employment nearer to where more unemployed people live.

Three major sporting facilities exist in or adjacent to the study area, and in combination with the passive **recreational** opportunities offered by the avifaunal and riverine environments, this area could become a major recreational zone for the metropolitan area.

LAND USE ASSESSMENT OF THE STUDY AREA

The information provided by the physical, biological, historical, demographic and recreational aspects of the study area, and the applicable land use policies and plans, combined with the adopted theoretical approach, leads to the conclusion that the value of the study area lies in its recreational, conservation, open space, green lung and tourist potential, and should be developed as such.

For the purposes of clarity, the study area is divided into 15 distinct **eco-rooms**. These are described and analyzed to determine their best use. Each eco-room is given a sensitivity rating in terms of its biological, historical and open space character.

Current land use is usually a major determinant for future use. Combined with the fact that the study area is comprised of mostly State property, and that redevelopment funds are hard to come by, suggestions are made for the sustainable development of existing facilities for recreational, educational and low impact uses. This study serves as an example where community involvement can assist in the day to day management of a community amenity.

CONCLUSIONS AND RECOMMENDATIONS FOR THE STUDY AREA

Because of the limited developmental opportunities which exist in the study area, it is recommended that the natural features and historical and cultural elements and recreational nature of the area dictate future use, and that this be confirmed in a Policy Plan.

Since approximately 87% of the study area falls under the control of local or regional authorities, it is recommended that the whole area be formally unified under a single controlling body. The future protection of the area is recommended by classifying it a Limited Development Area (LDA) in terms of the system of protected areas currently available in South Africa under the Environmental Conservation Act of 1989.

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CHAPTER 1

1.1 INTRODUCTION TO THE DISSERTATION

This chapter describes the study area, presents the problem statement, the terms of reference and the aim of the study. It outlines the approach adopted and the assumptions and limitations which apply to the study. The public consultation procedure is discussed and the assumptions and limitations which apply to the collection, and to the presentation of that data, are listed.

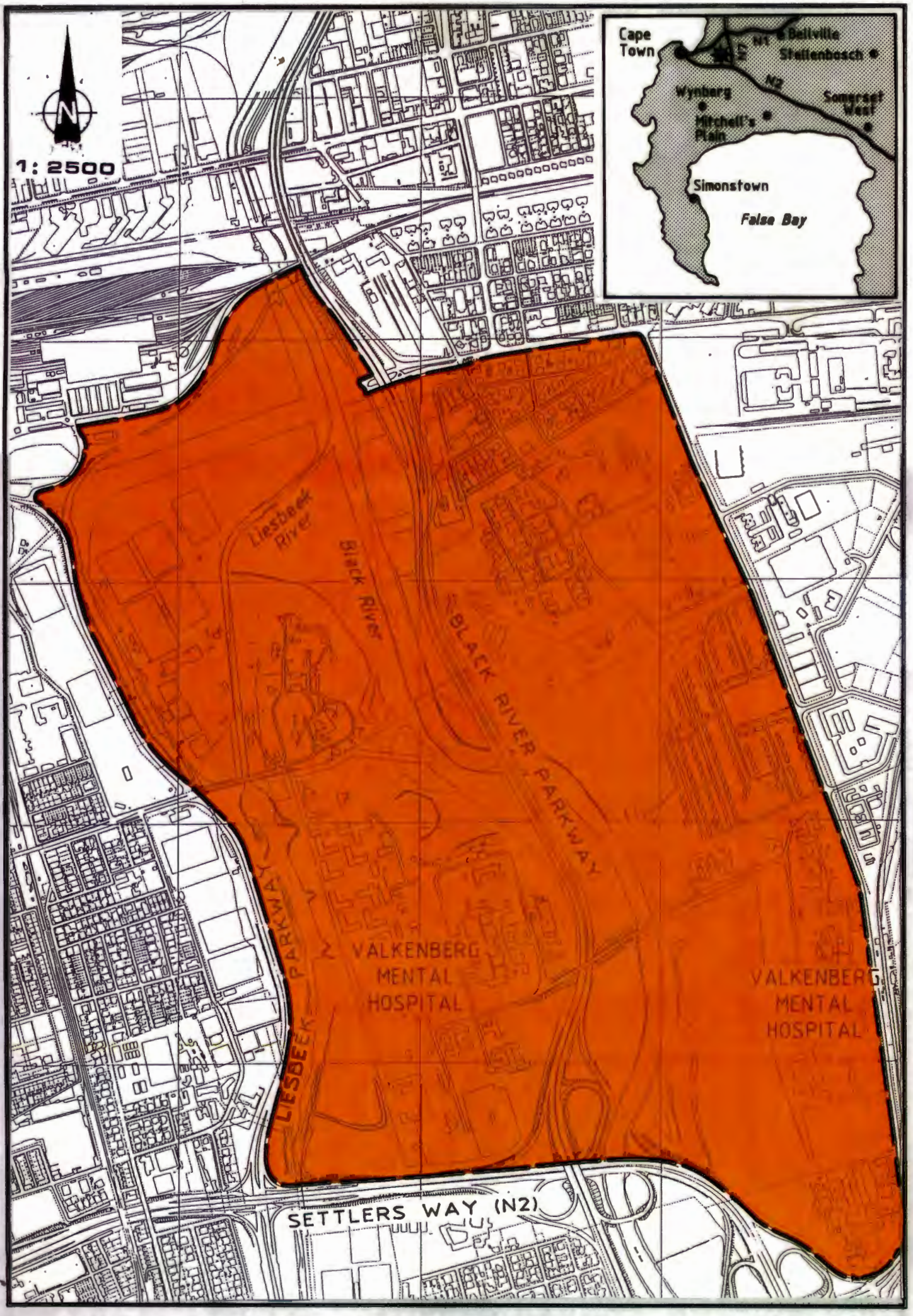
1.2 THE STUDY AREA

The study area is located in the South-Western Cape of South Africa. It measures approximately 232 ha and is 5.5 km south-east of the Cape Town Central Business District (CBD). It is situated in the lower reaches of the Liesbeek and Black Rivers, which run through it and meet in the extreme northern end. The study area is bounded by Liesbeek Parkway in the west, the N2 in the south, Alexandra Road in the east and the Culemborg railways marshalling yard in the north (see Map 1).

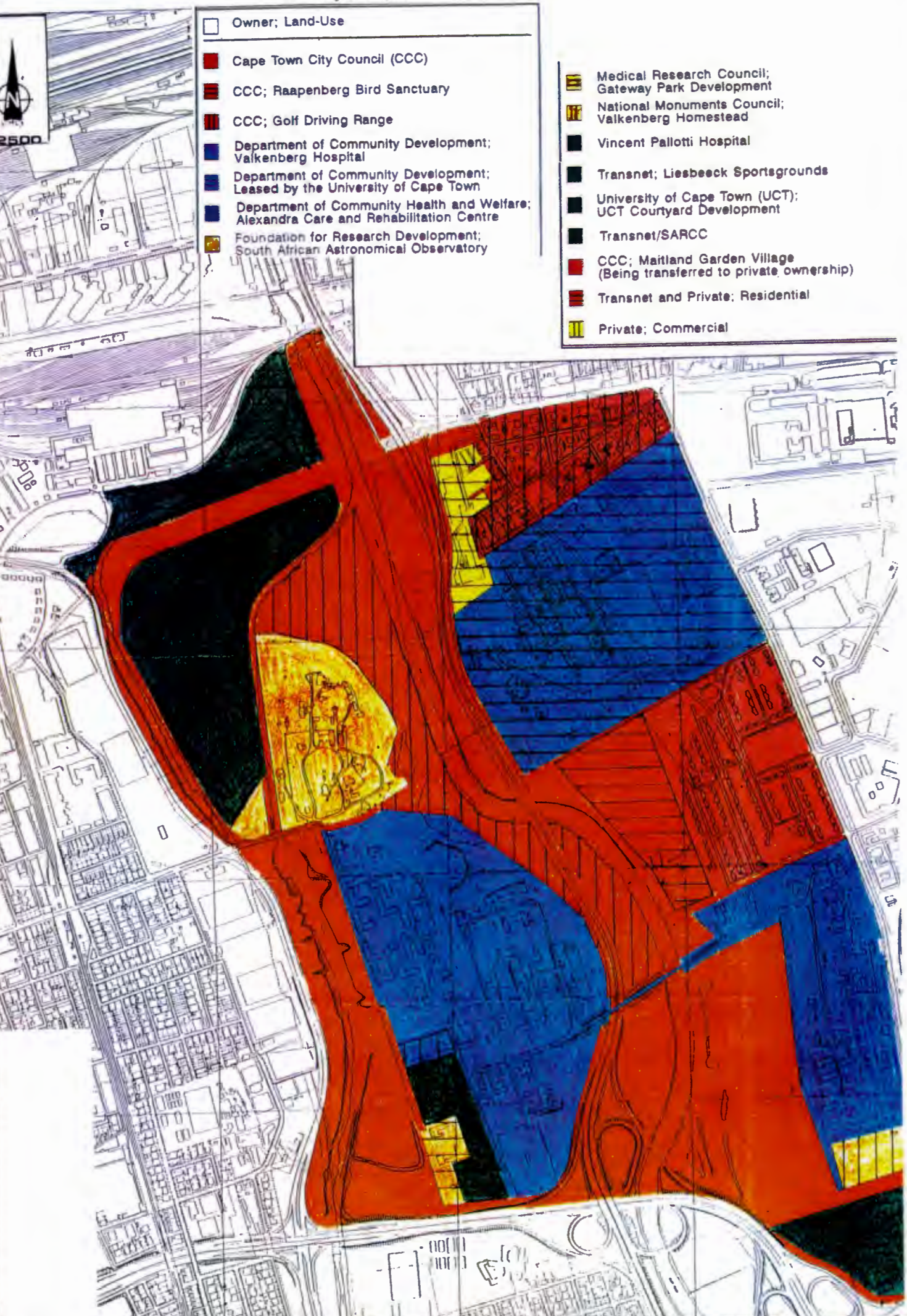
The main land owners in the study area are the Cape Town City Council (CCC), the Department of Community Development (Valkenberg Hospital), the Department of Community Health and Welfare (Alexandra Care and Rehabilitation Centre), the Foundation for Research Development (South African Astronomical Observatory (SAAO) and Transnet (Liesbeek Sports Grounds) (see Map 2).

Land use is mostly psychiatric, rehabilitative, recreational and research oriented, with a residential component.

MAP 1: **The Study Area.**



From the Baseline Information Document (1994).



1.3 PROBLEM STATEMENT

Background information is related in order to illustrate the nature of the conflict which has arisen around the study area.

The study area has been recognised for its high diversity of **avifauna** (Cape Bird Club, 1952, in Petersen and Bellas, 1987; Turpie, 1994). It has also been recognised for its **recreational** potential for the surrounding suburbs (Observatory Policy Plan, 1992). Motivations were made for the incorporation of the study area into the Observatory Policy Plan. The area was ultimately omitted from that document to form the "subject of a another study" (Observatory Civic Association 1989; Observatory Draft Policy Plan p8, 1992).

The current thrust for the re-development of the study area has provoked much controversy (Tatler, 23rd. June 1993; Cape Times, 27th. March 1993; Argus, 3rd December 1993; Burger, 23rd February 1994; etc). The focus of the conflict has revolved primarily around the sale of State land, ie **land bought and maintained with public funds**. The method of disposal of this land has been questioned, both in the local press and in the public consultation for the baseline study, which is the supplement to this dissertation. The public, as the defacto owners of this State land, felt left out of the negotiations for its sale (Baseline Information Document (BID) appendix 17). The sale of land was done in a non-participative manner, before "the other study", referred to in the Observatory Policy Plan, was undertaken (Ibid.).

The above process of state land disposal, holds major implications on a National level and could set precedents for the country. The Army, Navy, and Air-force, all have extensive land holdings locally, regionally and nationally, some of it comprising environmentally sensitive areas.

It is not known who initiated the sale of parts of Valkenberg Hospital, but this fact has created an impression that the whole area is now open to **redevelopment**. Further, there is the impression that the three major state institutions ie Valkenberg Mental

Hospital, Alexandra Care and Rehabilitation Centre and the South African Astronomical Observatory, might be re-located (BID, p111-113). These institutions are not aware of their proposed relocation.

During this controversy many other issues were also raised, such as the areas conservation worthiness, city planning, historic and cultural elements and the therapeutic (hospital) nature of the study area (BID, appendix 17).

On the issue of the sale of State land, one would assume that were land sold to bolster **capital** requirements, then full market value would be the prime requirement by advertising on the open market. This appears not to have been the motivation. Land has been disposed of at **below market value** to UCT, approximately R1 million having been paid for 2.4 ha (BID, p67). An argument exists that should the land have been sold to the **highest** bidder then a **worse** case development scenario might result. This might be a valid argument, but this process should also be transparent, advertised and open to all, so that the "best" purchaser could be chosen by consensus and in keeping with a policy for the area.

As an example of how State land is disposed of, a parcel of land on the eastern side of Valkenberg Hospital was "sold"/allocated to the Medical Research Council. It was then resold to a developer whose sole task was to have it rezoned through a proposed development which never took place (the first Gateway Park proposal). The application was passed with certain developmental **conditions** attached. Thereafter it was resold and, through another rezoning application to the Cape Town City Council, **departures** from the conditions previously set were sought and obtained. These are too detailed to elaborate on here. This rezoning was approved and the land was sub-divided into four plots bearing a **general commercial zoning**, all in a hospital environment and without a guiding Policy or Structure Plan.

All these rezonings were passed, despite objections at each stage, including appeals to the Administrator.

Dissatisfaction with the above processes was confirmed by interviews with Interested and Affected Parties (I&AP's) who indicated unanimity about the inappropriateness of the current zoning scheme (BID, p111, appendix 17, table 2).

With the approach that has been adopted for this study, the method of disposal of State land and the current rezoning scheme are important factors. Most of the study area is publicly owned and therefore does not have to be "acquired" for public use.

Further, during the consultation of Interested and Affected parties for the BID, (p111), strong criticism was levelled at the Cape Town City Council Planning Department for failing to:

- undertake a separate study before approving re-development proposals
- take public objections into account
- enforce current zoning conditions
- protect public assets and resources
- conduct a public consultation exercise.

The Cape Town City Council and its planners have been seen to act unilaterally and undemocratically with the Cape Provincial Administration. This is confirmed by a summary of the interviews with 62 Interested and Affected Parties who indicated that they were unanimous in their reservations about planning in Cape Town (BID, p111) and about the lack of effective public consultation.

UCT's Courtyard development formed the focus of objection, because UCT were aware of public objection from a very early stage. They benefitted from the same unilateral and undemocratic processes as detailed above, despite their reputation as an Institution opposed to such undemocratic practices. They were also the first to actually proceed with high density residential development in an area which has not seen such a precedent since the establishment of the Hospital in 1891. This was done without a guiding plan and was seen to benefit only the University, who were unwilling to wait for the outcome of a full public consultation process.

In view of the conflict which arose as a result of the UCT Courtyard development, and their intention to develop additional land in the area as another campus or residences (City Planners Dept., 1993), the UCT Planning Unit approached the Department of Environmental and Geographical Science to undertake a study to provide information which would guide future land use decisions for the area. The support of the Cape Town City Council Planning Unit was sought and obtained, and the Baseline Information Document (BID) was produced.

1.4 TERMS OF REFERENCE FOR THIS DISSERTATION

The 1994 M. Phil. (Environmental Science) class was requested to undertake a study which would provide a baseline information document (BID) on the environmental characteristics and conditions of the study area.

The terms of reference for the 1994 M. Phil. class is to provide an analysis and interpretation of this BID. This was to be done using such other materials and insights as are required to address particular fields of interest and to support their own conclusions for the most appropriate land use for the study area.

1.5 AIM OF THIS STUDY

The aim of this study is to apply an analysis to the environmental factors, outlined in the BID, to argue the conservation worthiness, recreational opportunities and historical significance of the study area.

1.6 APPROACH TO THIS STUDY

This section is divided into two parts. Part 1 will present a schematic flow chart to aid the reader in following the logic of the dissertation, while part 2 will detail the underlying philosophy.

1.6.1 FLOW CHART OF THE LOGIC FOLLOWED IN THIS DISSERTATION

The flow chart which follows, aims to show both the underlying logic and structure of this dissertation.

1.6.2 UNDERLYING PHILOSOPHY

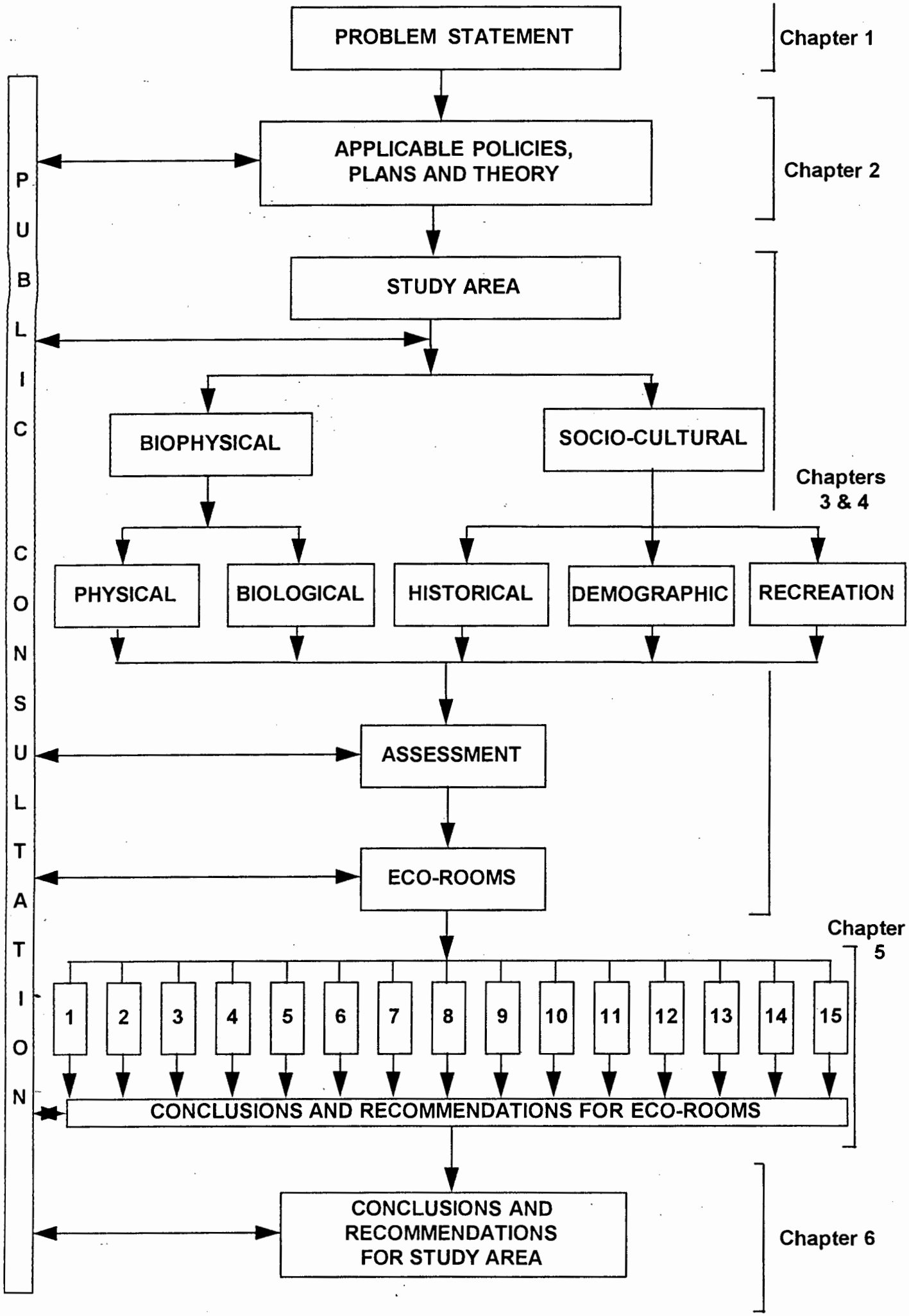
For the purposes of this study, it will be assumed that there are no inherent, fundamental and absolute constraints to the redevelopment of the study area. For example, the constraints presented by the 1:50 year flood line and by current land ownership could be overcome in order to accommodate redevelopment. These are both issues which have been identified as affecting the study area.

There are three underlying philosophies to this study.

- **That the emerging approach to environmental constraints is one which is more environmentally accommodating, requiring less severe hard engineering solutions. This view is propounded by Purseglove et al (1989) and others.**

Traditionally, hard engineering solutions are available to raise low-lying land out of the flood plain, as demonstrated by the reclamation of the foreshore and the Salt River Vlei. River widening, concrete canalisation or even the infilling of some existing river courses, to achieve this end, could be financed through the sale of the State land. This is largely the current approach being adopted by the authorities.

TABLE 1: Flow chart representing logic followed in dissertation.



Converting existing river courses into underground conduits, river widening, channelisation and canalisation, as proposed by the City Council (Lief, 1994) are all seen to have serious negative environmental impacts, the desirability of which would have to be examined by full impact assessments.

- **This dissertation aims to address global environmental problems at a local level in evaluating proposed scenarios for the study area.**

Global environmental concerns, such as the warming of the atmosphere, ozone depletion, habitat loss, water conservation and wildlife and botanical diversity loss, are perceived to involve potentially serious impacts for the sustainable utilization of the earth for humans and animal alike (IUCN Report 1989). Each of the above mentioned environmental concerns are receiving increasing academic and research attention (Ibid).

These global issues are perceived to arise from the cumulative effects of local activities.

This study will demonstrate how these environmental constraints can best be converted into opportunities, without resorting to hard engineering options or economic determinism, thereby avoiding the negative environmental impacts associated with them.

- **That the constraints presented by current land use in the study area can be manipulated to be of benefit to a greater population than is at present the case.**

In view of the large area occupied by the major institutions, it has been suggested, by various I&AP's, that the relocation of these facilities should be considered.

This relocation of the institutions and subsequent redevelopment of the land would lead to the fragmentation of the study area. The result would be a greater multiplicity

of ownership. This would undermine the feasibility of implementing holistic planning and lead to negative social impacts.

1.7 ASSUMPTIONS AND LIMITATIONS OF THE STUDY

1.7.1 ASSUMPTIONS

The same two assumptions made in the data collection process for the BID, apply to this dissertation. These are that:

- the technical information gathered is correct.
- the I&AP's mirror the opinions of those organisations which they represent.

1.7.2 LIMITATIONS

The limitations of the information collected in the BID, and used in this dissertation, are that:

- The data collection had to take place simultaneously with the Culemborg-Black River (C-BR) study but remained separate from that process.

- Not all major role players could be involved due to the C-BR process.

- Time and money constraints dictated the information gathered.

- The interview process was not flawless and the extraction of issues entailed a degree of interpretation by the study group.

1.8 PUBLIC CONSULTATION PROCESS (PCP)

It is intended to use the information and opinions gathered from the I&AP's to inform and guide perceived needs for the area. This will be done on a continuous basis throughout the dissertation wherever public comment is available and applicable. Therefore it is included in this introductory chapter.

The opinions of the I&AP's will be related according to issues. Although the public consultation process (PCP) was not conducted exhaustively, ie the broad public were not consulted, the process did reflect most of the issues that were identified by the study team. Most of the people interviewed were professionals, and as such, the opinions expressed might not reflect those of the broad public. Even the non-Governmental groups are mostly represented by people of professional standing. This is a limitation as regards the insights and opinions of the broader community. However, the results can be regarded as informed opinions, and therefore, they have a validity of their own. The business and civic groups were those from which most "lay" opinion might have been gained.

1.8.1 ASSUMPTIONS OF THE PUBLIC CONSULTATION PROCESS

It will be assumed that:

- the 62 people interviewed (I&AP's) are representative of their groups and of the public who could have an interest in the study area.

- the representatives are informed about the study area.

- the number of statements for or against an issue can be interpreted as indicating the degree of support, or lack of it, for an issue.

1.8.2 LIMITATIONS OF THE PUBLIC CONSULTATION PROCESS

1.8.2.1 Limitations to data collection

The limitations related to the collection of the data, as reflected in the BID, p108 apply, namely:

- The number of I&AP's interviewed was limited.
- Methodological limitations exist due to time and money constraints.
- I&AP's were selected from over 100 possible participants.
- Group representatives might not always reflect the broader group members and issues.
- Note taking during interviews might not always have been exhaustive.
- Interview transcripts were not reviewed by those interviewed.
- The meanings of statements made were, of necessity, interpreted by the study team.
- Issues raised do not reflect the degree of support or lack thereof. An issue raised by one person is recorded in the same way as one which was raised by many.

1.8.2.2 Limitations to data presentation

The limitations to data presentation are stated below:

The data will be described numerically to show the degree of support, or lack thereof, for a particular statement and the number of neutral statements.

- it will be assumed that each value statement is equal to any other, i.e. an economist who says that millions will be made through development is given the same weighting as the bird specialist who says that a Steppe Buzzard is more important than a million rands.

- there is no difference between what each group is saying i.e planners are not more important than the NGO's. The values of each group are given equal weighting in the evaluation.

1.8.3 CATEGORIES OF I&AP'S INTERVIEWED

There were 62 people interviewed (see list in BID, p161), representing about 44 organisations spread over 12 broad categories. These categories were:

- **Environmental Non-Government Organisations - 9 people interviewed**
- **Civic and Political Organisations - 6 people interviewed**
- **Civic Authorities - 18 people interviewed**
- **Study Area Landowners - 6 people interviewed**
- **Business - 5 people interviewed**
- **Sports Organisations - 2 people interviewed**
- **Professional Institutes - 3 people interviewed**
- **Historical Societies - 3 people interviewed**
- **Religious - 2 people interviewed**
- **Tourist - 2 people interviewed**
- **Planning Consultants - 5 people interviewed**
- **Academic - 1 person**

Details of the organisations within each category may be found in **Appendix 1**.

This analysis shows a wide spread of representation, with the most interviews having been conducted with members of the local authorities and their consultants.

1.9 STRUCTURE OF THE DISSERTATION

The structure of the dissertation is summarized in the table below:

CHAPTER AND TITLE	BRIEF DESCRIPTION AND AIM
CHAPTER 1: INTRODUCTION	BACKGROUND TO THE STUDY.
CHAPTER 2 : LAND USE POLICIES AND PLANS	SETS THE STUDY IN A PLANNING AND POLICY CONTEXT.
CHAPTER 3 : BIOPHYSICAL ENVIRONMENT	ASSESSES THE PHYSICAL AND BIOLOGICAL ENVIRONMENT OF THE ENTIRE STUDY AREA.
CHAPTER 4 : SOCIOECONOMIC ENVIRONMENT	ASSESSES THE HISTORICAL, ARCHAEOLOGICAL, DEMOGRAPHIC AND RECREATIONAL INFORMATION FOR THE STUDY AREA.
CHAPTER 5 : ASSESSMENT OF ECO-ROOMS	BASED ON BIOPHYSICAL AND SOCIO-ECONOMIC FACTORS, THE AREA IS DIVIDED INTO 15 ECO-ROOMS. APPROPRIATE LAND USES ARE SUGGESTED FOR EACH.
CHAPTER 6 : OVERALL CONCLUSIONS AND RECOMMENDATIONS	RECOMMENDATIONS ARE MADE FOR THE ENTIRE STUDY AREA.

TABLE 2: Structure of the Dissertation

CHAPTER 2

THEORY AND LAND USE POLICIES AND PLANS

2.1 INTRODUCTION

This chapter aims to set the study area in a policy and planning framework. To this end, documentation is discussed which lends theoretical support and principles for the use of open space for recreation, rehabilitation and research. The land use policies and plans applicable to both, metropolitan Cape Town, and to the study area, are discussed.

2.2 OPEN SPACE THEORY USED IN THE APPROACH TO THE STUDY

Metropolitan Open Space System (MOSS) principles are contained in the following four documents, and will be used to support the aims of this study, as set out in Chapter 1. The documents include; two publications by the "Council for the Environment", "Guidelines for environmental conservation and environmental creation in structure planning for the urban environment" (1989), and "Guidelines for the planning and management of Natural Open Space in urban areas" (1989). The other two documents are; "Planning of Metropolitan Open Space in the Cape Metropolitan Area" (1994), and "MOSS - International Conference" (1994).

The Council for the Environments guidelines on "Natural Open Space" will be reviewed in detail, as will those of "Planning of Metropolitan Open Space". The other documents are used to support the theoretical approach.

The recommendations emanating from the relevant Land-Use Policies and Plans, as presented in the BID (Chapter 7), will then be synthesised and presented.

Additional theoretical support for the approach adopted in this dissertation will be obtained from the United Nations blueprint for the environment, Chapter 28 of Agenda 21. This sets out principles which can be adopted by local authorities.

> "Local authorities construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and sub-national environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promotes sustainable development." (MOSS, 1994).

As these principles are applicable at a metropolitan level, they will form part of the recommendations to be made for metropolitan planning, and will be discussed further in the concluding chapter of this dissertation. A summary of these principles will be reproduced and placed in the **Appendix 2** of this dissertation.

The example of Curitiba, which is a city in a developing nation, where open space planning has formed an integral part in the restructuring of that city, will also be cited and a brief resume of the principles involved will be included in **Appendix 3** and will be referred to in the dissertation.

The chapter concludes with a discussion on open space standards and densification, using further theoretical references. The suitability of the study area to meet densification needs, will also be examined, with reference to the opinions of I&AP's consulted.

2.3 THEORETICAL APPROACH TO OPEN SPACE

The Council for the Environment was established in 1982 as an advisory body to the Minister of Environmental Affairs and was given the task of formulating a national environmental policy and strategy. They have produced a series of documents relating

to various aspects of the environment in its broadest sense. The two documents cited in this dissertation, are from that series.

2.3.1 COUNCIL FOR THE ENVIRONMENT DOCUMENTS

The principles of the Metropolitan Open Space System closely follow the guidelines as published by the Council for the Environment (1989).

2.3.1.1 Principles

These Council principles will be outlined first.

- A primary principle behind the Council for the Environments approach is to avoid an uncoordinated open space policy (Ibid p2).

  "If open space is provided on an ad hoc basis due to a lack of a goal-directed and coordinated open space policy, the result would be space and facilities lacking any meaningful functional physical and visual integration into the overall urban structure. 'Space left over after planning'(SLOAP) is the term used to refer to useless fragments of land where open space is not planned simultaneously with other land uses."

- An important principle contained in the document (p2) is that,

  "urban open space is vulnerable to fragmentation or replacement by other land uses unless adequately protected. Once the space is lost it cannot recover its former use and value".

Application of these principles to the study area.

The study area has both **functional** and **visual** meaning: **functional** in that it has an existing use and that it supports natural systems, in the wetlands and the avifauna which characterise the area, and **visual** in that it is a highly visible area from many points, with pleasing architecture and vegetated fields providing a contrast from the surrounding built environment.

The study area is also vulnerable to the pressures of fragmentation through river widening and other ad hoc developmental pressures such as the UCT Courtyard and Gateway Park examples.

2.3.1.2 Open Space Guidelines.

These documents by the Council for the Environment contain the following guidelines for the planning and management of open space:

"An **open space standard** is required, stipulating the minimum amount of urban land to be allocated to open space expressed as a surface or density formulae. This should be;

- Variable and not uniformly applicable;
- Should be re-evaluated from time to time to meet changing circumstances."

Application of open space guidelines to the study area

The applicable policy plans for the study area, point out that the surrounding suburban areas lack open space of any meaningful magnitude.

2.3.1.3 Ecological Guidelines.

Urban open space should serve to protect **ecological systems** through protective actions and regulations based on the importance of the system. These actions should be based on:

- **ecological research**
- **topographical features** such as streams, wetlands, ridges and koppies etc.
- **water systems** and especially wetlands should be protected "to facilitate the absorbtion and containment of storm water run-off, with controls on erosion, sedimentation, water pollution and over-utilization of surface and subterranean water" (Ibid p4).
- the systematic eradication of **invader plants.**
- the provision of interconnected **corridor spaces** to link open spaces so as to provide continuity of habitats and visual effects.

- the protection of the inhabitants from **"man-caused natural disasters"** such as:
  – **floods** – "through the exclusion of development from at least the 1:50 year flood lines, as well as flood attenuation by stilling ponds and ground water recharge" (p4).
  – **landslides** – caused by developments in unstable areas.
  – **erosion** – by restricting developments to suit the nature of the land.

Application of ecological guidelines to the study area

All the above factors are of relevance to the study area and are discussed in chapter 3 (Biophysical), and are applied when deciding on land use options for the eco-rooms in chapter 5.

2.3.1.4 Recreational Guidelines.

The provision of **Recreational Facilities** should be based on:

- scientifically accountable research on the preferences of the community
- the carrying capacity of the land
- both active and passive recreation
- the provision of facilities for commuters in the form of pedestrian and cycle paths
- the safety of people
- maximum accessibility

Application of recreational guidelines to the study area

The study area is recognised at a metropolitan level for its recreational potential (BID, p68), and has been identified as an important element in the provision of pedestrian and cycle tracks, and for its central and accessible position (C-BR study, 1993b). Further study is required to ascertain the carrying capacity of the area, how best pedestrian access can be facilitated and how security can be ensured.

2.3.1.5 Aesthetic Guidelines.

Visual amenity refers to:

- **scenic landscapes** which should be retained and protected,
- open space should be treated as an **integral part** of the urban architectural form.

Application of aesthetic guidelines to the study area

Both of the above attributes are well met by the study area as it is encased by major roads and is therefore highly visible to all city bound commuters and by visitors to the city, hence the "Gateway to the City" description which has been given to the area.

2.3.1.6 Noise Guidelines.

Open spaces can be used to good effect to reduce **noise** pollution by constructing berms or planting vegetation to screen sensitive receptors, such as residential areas or hospitals, from sources such as traffic.

Application of noise guidelines to the study area

In this respect, the study area has a good deal of potential. Dredged material, which is very fertile, is easily obtained from the rivers, which are in close proximity. This material can be used to line the surrounding arterial routes with vegetated, earth berms. This would also result in considerable savings in reduced transportation costs and environmental damage at the dump sites for the dredged material. This aspect is further explored in chapter 5.

2.3.1.7 Educational Guidelines.

The **educational potential** offered by open spaces should be maximised by developing educational trails, centres exhibitions and activities. In this regard **educational**

organisations and institutions as well as the **public** can be usefully engaged and even employed.

Application of educational guidelines to the study area

This has already begun to take place within the study area with the establishment of the Cape Town Environmental Centre. Many of the surrounding schools, teacher training colleges and the University, amongst other groups, make use of the Centre and the study area for environmental and research projects.

The Trails Club of South Africa are currently exploring the possibility of a community driven initiative for a combined walking, jogging and cycling, urban trail in the confluence area.

2.3.1.8 Financing Guidelines.

When considering the **financing** of open spaces, the following guidelines are given:

- Local authorities should base the acquisition, development and management of open spaces on a **long-term financial strategy**.
- The provision of the funds to implement these actions should be given an appropriate priority in the budgets of local authorities.
- The **affordability and cost-effective management** of open spaces should pay attention to the following:
  - efficient organisation of the relevant departments
  - staff motivation
  - acquisition of land through alternative methods
  - acquiring privately owned land as open space in exchange for certain privileges
  - public assistance should be sought in the maintenance of open spaces
  - use made of low-maintenance developments
  - preventative rather than rehabilitative measures

- private sector involvement
- zoning of privately owned land as "private open space" with compensation.

The Council for the Environment further points out that local authorities should monitor open spaces in regard to their proper use, changing needs and to avoid unnecessary duplication. The privatisation of open spaces and facilities should be considered to generate income through a **market-orientated approach** if the local authority is unable to do this themselves.

Application of financing guidelines to the study area

Many of these cost disadvantages do not apply to the study area as it is already in public control. The issue of private sector involvement is pursued further in chapter 6, where ideas on subsidised financing, on a user pays principle, are suggested.

2.3.1.9 Research Guidelines

Research into open space and recreation should be focused on:

- **problem areas** or areas where there is insufficient data
- **co-ordination** by a central body
- a **multi-disciplinary** approach.

Application of research guidelines to the study area

The Masters study is an example of such a recommended approach. More research is necessary and the City Council has a great deal of expertise in this respect.

2.3.1.10 Planning Guidelines.

The **planning** of open spaces should involve:

- the adoption of a **definite planning policy**

- a **multi-disciplinary** approach
- **co-ordination** between local, regional, provincial and central government where appropriate
- **consultation** with non-governmental organisations
- an **environmental analysis**
- the timeous **identification and zoning** of land corridors.

Application of planning guidelines to the study area

The ultimate recommendation of this dissertation is for the implementation of just such a planning policy. This should be done on a participatory basis with the landowners and surrounding communities.

2.3.2 "OPEN SPACE PLANNING IN METROPOLITAN CAPE TOWN"

The discussion document, "Open Space Planning in Metropolitan Cape Town" (1994), was released by the Cape Town City Planning Branch as a prelude to the formulation of an open space network for the metropolitan region.

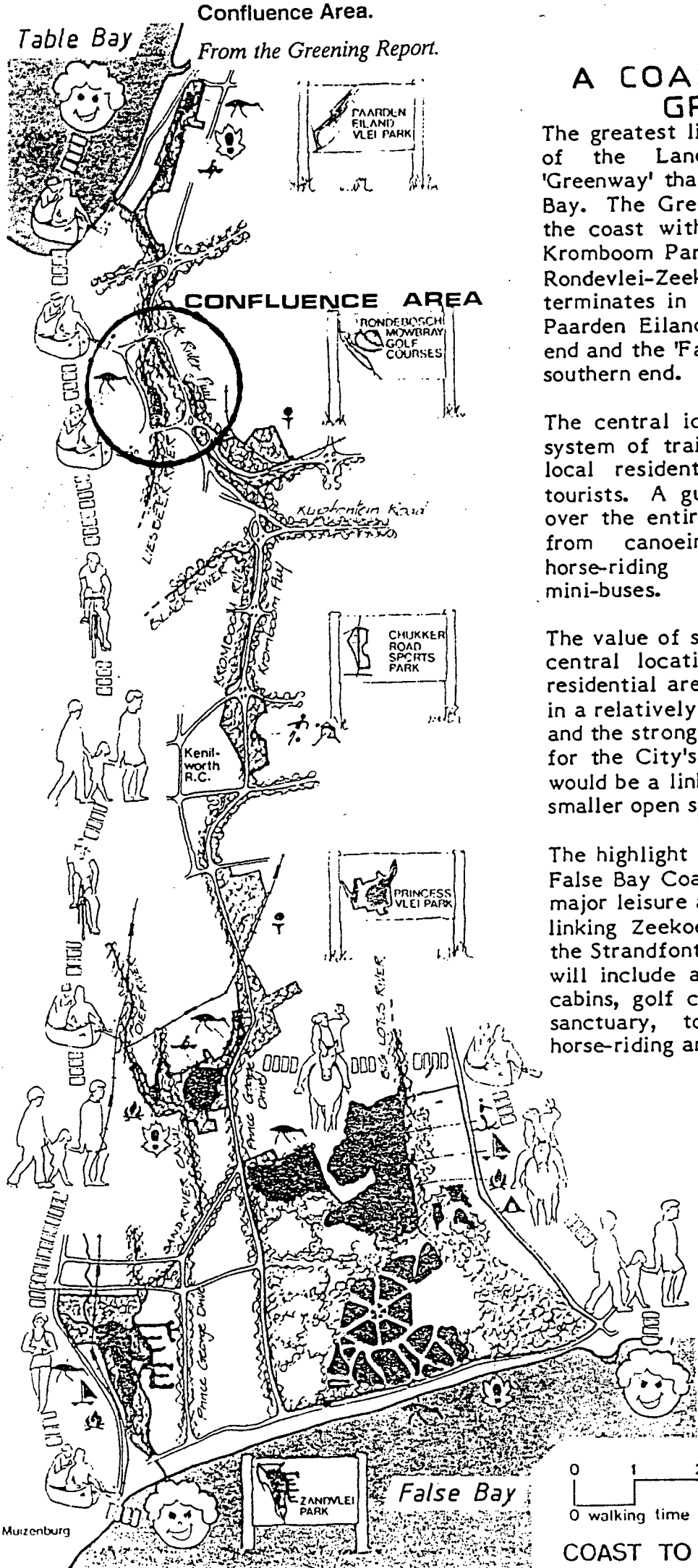
2.3.2.1 Theory presented in "Open Space Planning in Metropolitan Cape Town".

Suggestions contained in it, indicate that the definition of the role of open space can go beyond those of large parks and natural areas. The opportunities as presented in the document can be applied to the whole study area. Open space plays a beneficial role in

- health, well-being and cultural interests - these include areas for recreation, both passive and active, aesthetic considerations, environmental education, religious and social uses as well as areas for pollution control and climatic influence.

MAP 3: Coast to Coast Greenway Map showing Green Belt Status of the Confluence Area.

From the Greening Report.



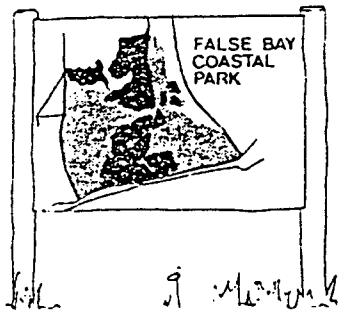
A COAST TO COAST GREENWAY

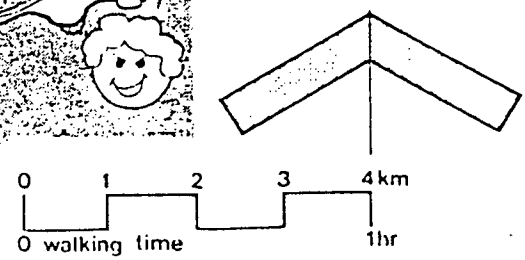
The greatest linear park and central spine of the Landscape Framework is a 'Greenway' that links Table Bay with False Bay. The Greenway is formed by linking the coast with the Black River corridor, Kromboom Parkway, Princess Vlei and the Rondevlei-Zeekoevlei resources. Each end terminates in a major regional park - the Paarden Eiland Vlei Park at the northern end and the 'False Bay Coastal Park' at the southern end.

The central idea of the Greenway is the system of trails that will be available to local residents, recreation seekers and tourists. A guided tour could be possible over the entire length by changing modes from canoeing to bicycling, hiking, horse-riding and even recreational mini-buses.

The value of such a greenway would be its central location in terms of the City's residential areas, a recreational attraction in a relatively featureless part of the City, and the strong image that would be created for the City's open spaces. In addition it would be a linking element for many of the smaller open space corridors.

The highlight of the Greenway will be the False Bay Coastal Park which is seen as a major leisure attraction and holiday resort, linking Zeekoevlei, Rondevlei and part of the Strandfontein Coast. The Coastal Park will include a resort village with holiday cabins, golf course, wildlife park and bird sanctuary, together with a series of horse-riding and canoeing trails.





COAST TO COAST GREENWAY

- conserving natural processes and ecosystems, such as wetlands, mountains, corridors for dispersal of species, habitats and useful natural processes which influence air quality/pollution, soil stabilisation etc.

- movement corridors and urban utility sites - utility sites include dams, waste water treatment, power lines and pipelines etc., while movement corridors could include rivers, roads and air fields etc.

- the provision of managed resources, such as forests, urban agriculture, ground water recharge, wood lots, traditional medicines and food.

- shaping development - open spaces provide separation between different land uses, control urban sprawl and provide character for cities or districts.

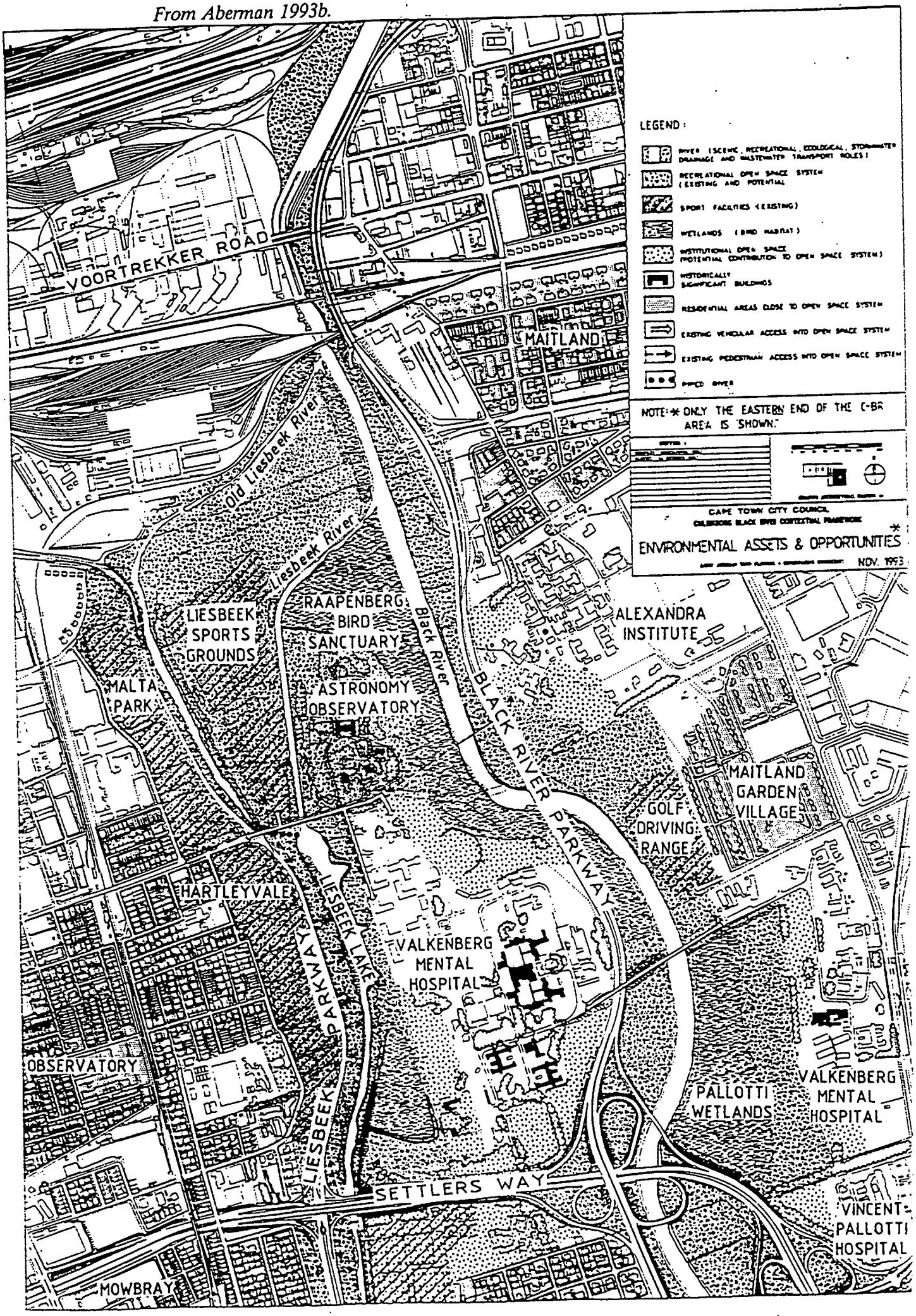
2.3.2.2 Discussion of Open Space Planning

The pressures which are being brought to bear on the study area can be classified as part of a planning approach known as "growth management" (Ibid). Rapid urbanisation is resulting in large, formerly open spaces, being occupied by unplanned informal settlements, and in the southern suburbs, by ad hoc developments, with consequent environmental and social impacts. The Curitiba commitment to sustainable development draws attention to this fact and calls for "the establishment of community consultation processes that bring together representatives from all walks of life to create partnerships for sustainable development" (see appendix 3).

This unmanaged growth results in the wrong land, such as wetlands and dunes being used for development. Using land in the wrong way has long term consequences for the future sustainability of the city. If the rich heritage of quality environments, which form the basis of a local tourist industry worth over R1.4 billion annually (Cape Town City Council, 1993), is destroyed, then the CMA will not remain a highly desirable place in which to live and work with resultant social disintegration.

MAP 4: **Environmental Assets and Opportunities.**

From Aberman 1993b.



An identification of suitable open space environments and suitable land for development, form two sides of the same coin representing urban growth planning. This identification of land uses should begin with a study of the landscape and its natural processes which offer opportunities and constraints to these different types of uses (McHarg, 1969).

Such an approach, had it been applied in the CMA, would have avoided many of the problems which characterise both planned and unplanned settlements in this developing region e.g. the winter inundations which result from developing low lying land which is subject to flooding from a combination of rain and the high water tables.

This natural systems approach to analysis could just as well be applied at a national level. If open space areas are first identified and then fixed as planning elements, a framework can be developed to provide a physical control for land use. Open spaces, based on these natural characteristics then highlight other areas best suited for developing built environments.

The above approach is very suited to developing scenarios as experienced here in Africa and other "Third World" countries, but can also be applied in the present case study within an existing built environment. Given the undeveloped character of the study area, an opportunity exists to provide such a natural systems approach to the development of open space for the southern suburbs, where such provisions had not been built into the current urban fabric.

2.3.3 INTRODUCTION TO THE RELEVANT LAND USE AND POLICY DOCUMENTS

There were nine documents dealt with in the BID (Ch.7).

- Cape Metropolitan Area Guide Plan
- Greening the City
- Interim Metropolitan Development Framework

- Western Cape Economic Development Forum (WCEDF): Proposed Guide Lines For the Release of Public Land
- Culemborg-Black River Contextual Framework
- Observatory Policy Plan
- Rondebosch Mowbray Local Area Plan
- Salt River/Woodstock/Walmer Estate/University Estate Local Area Planning Process
- Maitland Local Area Plan.

These will not be examined individually, as was done there, but will be dealt with collectively to obtain a synthesis of them at three levels, namely, metropolitan, peripheral and site specific.

2.3.3.1 Metropolitan Context

The documents covered in this section stress the need to **check urban sprawl through a process of urban densification**. They also contain recommendations that:

- ecological processes be protected (BID, p97)
- no urban development be allowed in flood plains (BID, p96)
- the historical character of complexes and not just individual buildings be preserved (BID, p95)
- urban land be used for purposes for which it was originally intended (BID, p101)
- as rivers cut across municipal boundaries, there be co-operation between these authorities (BID, p97)
- rivers receive a recreational emphasis (BID, p97)
- open space be provided (BID, p95)
- a process of public consultation be adopted (BID, p101)
- a "package of plans approach" be adopted for the release of public land (BID, p101)
- Integrated Environmental Management (IEM) principles be followed for sensitive land (BID, p101).

In effect, many of the tenets espoused in this study are endorsed by the Policy documents analyzed in the BID. The Metropolitan guide plan even goes so far as to identify the confluence area within the study site as a potential Protected Natural Environment (PNE) (BID, p96).

2.3.3.2 Peripheral Context

The local area plans all indicate that the suburbs surrounding the study area will undergo pressure for residential densification and that they currently lack open space and treed areas of any significance (BID, p102). Concern is expressed that the architectural and historical character of the areas be protected.

2.3.3.3 Site Specific Context

The Culemborg-Black River Contextual Framework (C-BR) is an initiative which impinges directly on the study site, and according to some (de Tolly 1993, pers. comm.) the study area falls within that framework. This contention is challenged by others who say that the current study area does not fall within the C-BR study (de Wet, 1993, Shandler, pers. comm.). The author who has been involved in the C-BR public participation process, is not aware of public consultation on the subject of the contextual environment. This confusion, has in effect, given rise to the present study.

Recent developments have begun to take place in the study area before the completion of the package of plans process. As pointed out, this process has a strong emphasis on public participation. Recent developments are said to fit in with the "emerging contextual framework" (Cape Times, 3/1/94) implying that the City Planners Department has already decided what the framework will be. This is before the C-BR study is complete and long before the present study area has been considered by the C-BR package of plans process. The Courtyard development is said to even fit in with "precinct plans", which is a final stage in this "package of plans" process (de Tolly, pers. comm.).

MAP 5: **C-BR Contextual Framework Planning Area**

From Aberman 1993a.

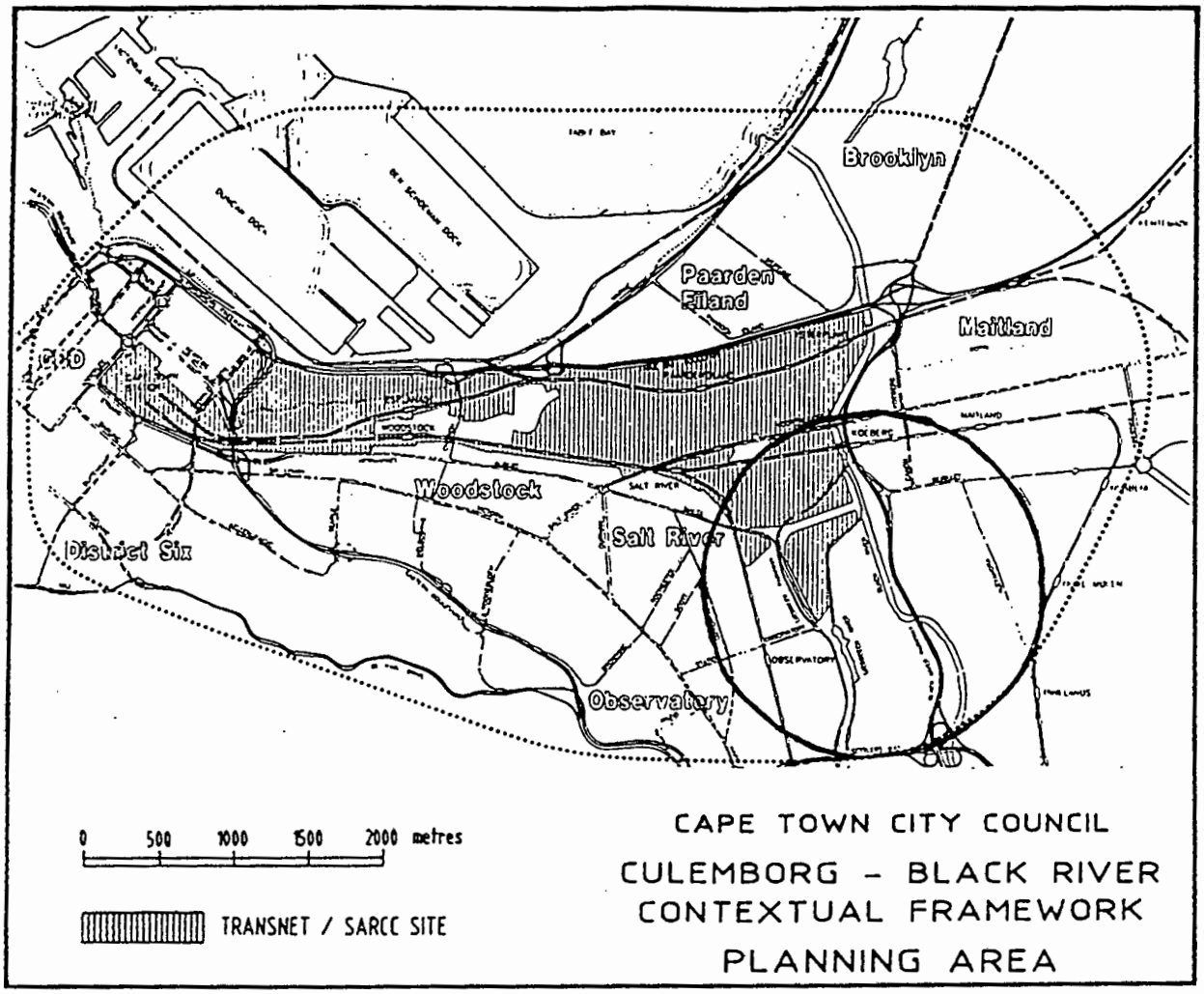
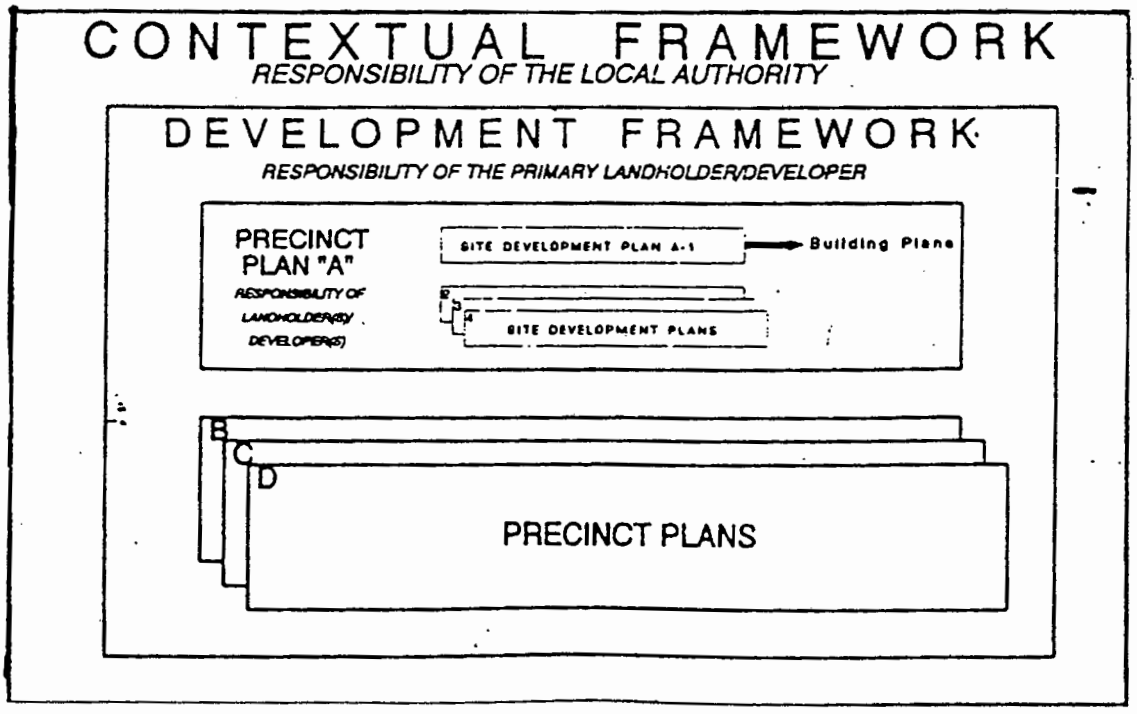


TABLE 3: **Package of plans.**

From Aberman 1994a



It is necessary to note that the study area is the only area within the C-BR study that has any natural systems and historical and cultural components, worthy of conservation. Once the re-development of the Culemborg site is complete, the confluence area will become an even more valuable recreational zone than is currently the case.

The Stage B report of the C-BR study contains a great deal of information on the study area as its aim is to;

> "evaluate assets, opportunities, problems, constraints and the goals arising from those factors. It presents a systematic analysis of issues identified in Stage A, incorporating implications of the Rationalisation Study, input from public participation and further work by the Contextual Framework planning team." (C-BR, Stage B, p 1).

The information and maps contained in this document along with the information and maps contained in the BID, make the study area a very studied one.

2.3.3.4 Summary assessment of the applicable policy documents

With respect to the study area, it would appear that at all three levels of Policy, the metropolitan, peripheral and site specific, the area is identified strongly with its natural elements, historical and open space character. As regards the desirability of built form in the study area, only the periphery or "activity corridors" along Voortrekker Road, appear to hold potential for such development. The BID (p104) stresses that before densification takes place in the surrounding suburbs, that the open space, recreational, green lung and conservation opportunities, first be assessed and receive adequate provision.

As stated earlier, little vacant land is available within the study area for the development of more built form, unless the current land owners are encouraged to re-locate. One can conclude that those small parcels of such land which might be identified should be turned over to the use recommended by this study.

Although these above Policy Documents are a useful and desirable guide, from an environmental point of view, to metropolitan development, experience would tend to suggest that the recommendations made in them are rarely adopted. For example, the Greening Report, published in 1982, has achieved few, if any, of its recommendations (BID, p98).

As all but one of the above documents are not legal instruments, they lack enforceable controls on development and are easily overruled through the current zoning scheme (see chapter 1).

The ultimate question to be posed by this present study is **how** one ensures that **recommendations** made in all the various studies which have a bearing on the study area **become binding** and are **applied.** There is no shortage of good ideas and recommendations, they just seldom seem to be implemented.

The plethora of local authorities, and departments within them, seems to be a possible cause of this state of affairs. Fragmented control has been identified as an impediment in the effective management of the Peninsula Mountain Chain. This is probably true for the application of any holistic policy for the study area.

One cannot have effective holistic planning if one has fragmented control over the implementation of that planning.

This realisation has led to initiatives for a Metropolitan Authority and for Metropolitan planning which would include areas such as Somerset West and Wellington etc.

The study area is recognised as a distinct land parcel, as is the Peninsula and its surrounds. A single authority approach will facilitate the effectiveness of all types of holistic planning and not only that of environmental planning. The study area has a distinct advantage in this respect, in that approximately 84% of the area is under regional or local authority control.

One needs to know however, whether open space is required in the metropolitan context.

2.4 OPEN SPACE STANDARDS

The Greening of the City Report suggests that open space standards should be based on "community specific standards", which are not uniform but are rather based on the local character, needs and opportunities of each district (Greening Report 1982). A recent discussion document produced in the United Kingdom by Box and Harrison, (1993), as discussed at the International Conference on MOSS (1994), suggests the following targets:

- An urban resident should be able to enter a natural green space of at least 2 ha within 0.5 km of their home.

- Provision should be made for statutory Local Nature Reserves in every urban area at the minimum level of 1ha per thousand population.

- There should be at least one 20 ha site within 2 km of all residents; at least one 100 ha site within 5 km of all residents; and at least one 500 ha site within 10 km of all residents.

In South Africa, the urban population is expected to double from 16.2 million in 1985 to 35.7 million in the year 2000. By the end of the century it is estimated that 79% of South Africa's population will be urbanised (Huntley et al, 1989).

The requirement for a 100 ha site within 5 km of all residents is met by study area. If one examines the available open space within a 5 km radius of the study area, one encounters the mountain and the sea. These two features of the Cape Peninsula have given rise to the impression that Cape Town has an inexhaustible supply of open space. In this regard, the region is well endowed.

The importance of the study area lies in the fact that it is centrally situated in an urban setting, access to which is possible by pedestrian movement, whereas the mountain and sea are not as easily accessed. Other large public open spaces are singularity lacking from the suburban environment in Cape Town. The next nearest large open space is that of Rondebosch Common.

In addition, the study area has a mix of formal and informal recreational open space, which is missing from the first two mentioned examples. Thirdly, the study area is mostly composed of a different type of environment than the mountain and sea, namely, rivers, wetlands and open grasslands.

Much literature exists as to the how, where and when of open space theory but not much on why the need. The predicted population growth figures for the country, help to show why open space is likely to become even more important than is currently the case. Provision should be made now for a multiplicity of future opportunities within the urban environment.

> "The importance of outdoor recreational open space should not be underestimated. Recreation is a basic need and results in a broad range of social benefits including: health (mental and physical); social interaction, including different age groups, cultural groups; crime prevention in poverty stricken areas; education etc." (Cape City Council, 1994).

The Greening Report (1982), provided a good basis for the formulation of an open space strategy for the greater Cape Town area. It has however failed to achieve the implementation of its recommendations. Only recently with the development of the MOSS concept in Durban, has renewed interest been shown in the concept of linked urban open spaces. This has resulted in the publication of Open Space Planning in Metropolitan Cape Town, (1994), and a conference on "A Vision of Cape Town", (1993). The issue of rapid urbanisation formed an integral part of the concerns expressed in the document and at the conference.

This process of urbanisation has led to urban sprawl with its negative impacts on open space. The suggested solution of which is a process of urban densification.

2.5 DENSIFICATION PRESSURES

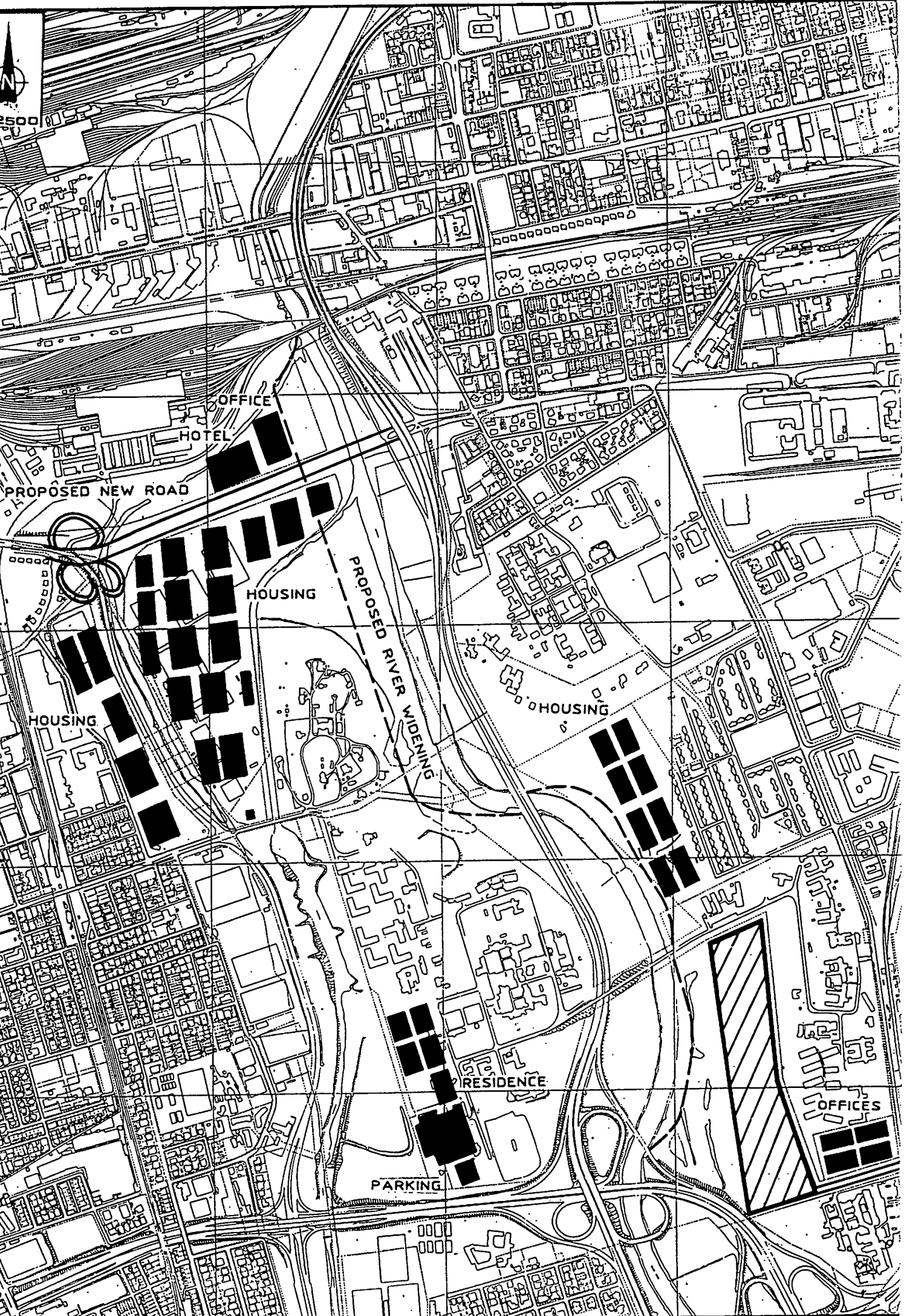
This term refers to the process whereby the carrying capacity of a land parcel, suburb or city is increased. This can be achieved by sub-dividing existing plots, high rise construction, the conversion of single storey areas to flats, the redevelopment of sports fields, State land and other vacant land.

The study area is therefore perceived to have great potential for such a process. However, this must be tempered in the light of the existing uses and character of the area. The Cape Metropolitan Guide Plan (BID, p95) places emphasis on the need for higher residential densities while considering the area's natural and historic character. It also advocates no development within a floodplain. The Western Cape Economic Development Forum (WCEDF) and the Council for the Environment (p 5) state that as far as possible, land be used for the primary purpose for which it was originally intended (BID, p101; Council for the Environment, 1989).

Although the necessity for densification is recognised, a system whereby this is to take place must be formalized. As yet, the City has not officially announced its intention to adopt such a process. If all undeveloped land is first built on, followed by sub-division of existing plots, followed by the development of District Six etc, little open space of any consequence will be left. Open Space requirements based on the projected figures of the surrounding urban areas, once densification has taken place, must first be calculated. A hierarchical system through which this densification is to take place then needs to be formulated bearing in mind that a large open space is preferable to several smaller patches.

In view of the unique open space opportunities offered by the study area, **alternative sites** for densification should first be identified and investigated. As the whole of the **Culemborg** area might be redeveloped, ample opportunity exists **there** and in **District Six**, at the **Waterfront** and possibly on the site of the present **Maitland abattoir** for the development of residential and commercial projects, close to the CBD, which is said to be suffering through a lack of such a residential element (Argus, August,1993). With

MAP 6: Possible scenario for the study area.



the rationalisation of the countries defence needs, much land from those quarters is likely to become available for redevelopment. These include the **army, navy** and **air force**, which have vast land holdings locally and nationally.

2.5.1 HOUSING NEEDS AND THE STUDY AREA

In regard to the fore-going, many people have identified the need for "low cost housing" for the study area and for Culemborg, and the potential which the two sites offer for righting the wrongs of the "Apartheid City". It must however be remembered that property prices in the area are very high (BID, p67) and that unless some form of subsidy is arranged, no such potential will be realised, leading to disappointment and frustration on the part of those affected. High-rise and other mass housing complexes might help address this issue. The study area, given its topography and natural systems, is not the best place for the location of such schemes as the impacts on the natural system will be severe.

2.5.1.1 Views of I&AP's on the suitability of the study area for housing

As there is a perceived need for housing in Cape Town, a question was formulated as to whether "the confluence area should be used to alleviate the housing shortage in Cape Town?" Six supporting comments were received for the statement, ten comments opposed the statement and ten were construed as being neutral (BID, app.17, table 13).

The overall impression gained as to the approach of the I&AP's was, that the study area was not practically suited to address much of the current mass housing backlog but that pockets of development might be possible.

2.5.1.2 Views of I&AP's on city planning in Cape Town

From the consultation with I&AP's, it was ascertained that there were strong reservations about the effectiveness of the planning process for the area (BID, p111).

This could of course be due to the fact that the Central State controlled institutions, of which the study area is mostly composed, were exempt from local authority planning. In the past, this was done at a Regional or National level thereby precluding the involvement of the local authorities.

However, the participants gave a strong indication that planning for the greater Cape Town area was not adequate.

In this regard, the zoning scheme for the area was also identified as being ineffective and flawed with most statements rejecting the current scheme (BID, app.17, table 2).

Overall, the results of the public consultation indicated that the study area has undeniable open space potential and that only the currently under utilized areas of the study area should be considered for further development.

CHAPTER 3

THE BIOPHYSICAL ENVIRONMENT

3.1 INTRODUCTION

This section of the document interprets the physical and biological information which interact to constitute a functioning system.

Planet Earth is an ecological system in which all matter and elements are linked. The destruction of any one part will have an impact on the whole. This holistic awareness of eco-systems has been referred to in academic and research dissertations for some time, but only recently are the disbenefits of developmental impacts being taken seriously.

> "All ecological disasters are economic disasters and governments are beginning to realise that bad economic policies lead to bad development" (Davies, 1993).

The conservation worthiness of the study area will be highlighted in this section and it will be shown how current planning and developmental pressures are undermining the integrity of the system.

This chapter is divided into three sections.

In the **physical** environment, the unique physical characteristics of the study area are highlighted as well as the damaging practices currently employed in managing the area. Suggestions are made for less environmentally damaging practices.

In the **biological** environment, the uniqueness of the avifauna found in the study area are highlighted and suggestions made as to how best this attribute can be developed as a resource for the City.

Finally, the extent of **open space** available within the study area is compared with the land outside its boundaries.

3.2 ASSESSMENT OF THE PHYSICAL ENVIRONMENT

3.2.1 TOPOGRAPHY

The topography of the study area offers a unique set of views over the rivers and wetlands of the surrounding Peninsula from the ridge, Slangkop, on which Valkenberg Hospital and the SAAO are situated. There are two west and one east facing slopes, making the study area a highly desirable location, offering a multiplicity of views and uses. Because of the ridge, which is approximately 12 metres above sea level, any construction on either the Slangkop Ridge or the Alexandra Road Ridge, would be easily visible from all surrounding viewpoints (not just for the residents of Maitland Garden Village, as assessed in the BID p28.).

Areas of the study area lying below the 4.6 metre contour line, fall within the 1:50 year flood line and are therefore unsuitable for construction of permanent buildings (IEM Guidelines, 1992; Greening Report, 1982). However, as a flood plain, the waterlogged river banks, wetlands and sports fields offer a rich winter habitat and food source for the avifauna found in the area by facilitating the development of habitats for oligochaete (worms). Current land use within the flood plains is of a recreational nature, in the form of sports fields or Bird Sanctuary, which are generally considered appropriate uses for such areas, although they are currently poorly developed for these purposes.

Flooding will receive further discussion under Hydrology, further in this chapter.

3.2.2 TEMPERATURE

Overall the temperature of the area presents no constraints to development of any kind.

The tendency of built environments, however, to create microclimates, should not be overlooked when determining the future of the study area. As the surrounding areas are already built up, more built form in the study area will aggravate the existing situation. It is recognised that as densification of the existing urban fabric in the Peninsula takes place, existing open areas should be used to counteract these negative impacts (IMDF, 1993). The study area offers an opportunity for the creation of a green lung of some consequence.

3.2.3 AIR POLLUTION

The build-up of air pollution in Cape Town is greatly affected by weather conditions. As temperature inversions cause serious air pollution levels over most of the Peninsula during the winter months (BID, p26), and as the study area falls within a particularly severely affected area as identified by von Schirndling (1990), every effort must be made to not aggravate the causes of this pollution when developing the study area.

Von Shirndling (1990) has listed the negative physical and psychological effects of air pollution on, in particular, developing children and the issue is receiving attention at a national level with the imminent introduction of lead-free petrol. Motor vehicles are a major source of air pollution and therefore more road developments within and around the study area are not advised.

The redevelopment of the study area should consider the benefits of using this large and sparsely populated area (232 ha) for addressing this air pollution. The absorptive qualities offered by vegetation are acknowledged (Planning of Metropolitan Open Space, 1994). Suitable vegetation could be introduced to the study area to attenuate the negative effects of pollutants, thereby creating a "green lung". The larger the green

lung, the more effective it will be. The establishment of many lesser green lungs however, would have the same effect.

3.2.4 NOISE POLLUTION

The Baseline Information Document states that:

> "Measurements of noise were taken throughout the neighbourhood .... unacceptably high levels of noise have been detected. Research on noise pollution has found that high levels of exposure to road traffic noise can be related to interference with sleep, aural communication, and other human activities, and can provoke measurable changes in both physical and psychological indicators of well being" (p27).

A 10dB(A) reduction in noise levels is recommended. Suggestions are made later in this dissertation as to possible methods by which this reduction could be achieved. Noise pollution within the study area will need to be addressed and a multifactorial approach to this constraint, will in all likelihood, prove to be the most effective.

The study area offers a unique opportunity to implement some form of noise and air pollution reduction techniques, making use of low cost and locally available resources. An experimental programme, testing before and after parameters, would be easily achieved using the study area as a test case. This could lead to further research in the study area.

I&AP's views on pollution

There was general agreement that all kinds of pollution are a problem in Cape Town and that steps should be taken to minimise these. These steps included stricter legislation and enforcement, the construction of berms to reduce noise, and a recycling emphasis (BID, app.17, tables 18&19).

3.2.5 PRECIPITATION

Due to the topographic characteristics and the relatively high mean annual rainfall of 622 mm for the study area, and the slow draining of the surrounding land into the wetlands, efforts must be made to retain as much rainfall on site, should any construction take place, so as to not negatively affect this seepage. Hardened surfaces will result in accelerated run-off and low absorptive qualities for the site (BID, p51 & 56).

It is predicted that water shortages will be a problem for the Cape Peninsula by the turn of the century. Such on site retention of water for irrigation and sewerage purposes, in conjunction with an educational programme on the benefits of reduced water consumption, will to reduce this threat.

3.2.6 WIND

The prevailing south-easterly summer and north-westerly winter winds in the area, affect the land use options noticeably. Not only does the wind exacerbate the air and noise pollution but it influences the recreational potential and vegetation types found in the area. The growing of vegetative wind breaks in the study area is difficult, due to the effects of the wind.

Although the strong winds might adversly affect the human use of the area, it suits certain species of bird which make abundant use of the thermals and up draughts created. These assist them to gain rapid elevation in order to continue their journeys to roosting or feeding grounds, usually at opposite ends of the Peninsula. This is demonstrated by the large flocks of gulls which assemble at Hartleyvale weir, and make specific use of the prevailing winds (Steele, 1991).

I&AP's pointed out that wind blown domestic waste was a problem in the study area.

3.2.7 GEOMORPHOLOGY, GEOLOGY and SOILS

The composition of the soils influence land use in terms of suitability for construction (BID, p18), therefore construction is limited to the existing properties of the major Institutions in the area.

3.2.8 THE LIESBEEK AND BLACK RIVERS AND THEIR HYDROLOGY

Although polluted and the cause of an annoying propensity to flood, these rivers are features of the landscape which are inextricably tied to their origins in the topography of the Peninsula, which makes the area so attractive to the great diversity of life forms which occur here, including human presence.

3.2.8.1 The history of the rivers

The history of the waterways, vleis and shores of the Peninsula bear testimony to human manipulation. The reclamation of the foreshore followed that of the Salt River vlei, which appears to have been a major natural feature when the first European settlers arrived.

Even van Riebeek had visions of engineering solutions to his defence problems, by attempting to link the various waterways from Table Bay to False Bay, in order to create a defendable border against the local inhabitants (Pama, 1979).

This study contends that each succeeding generation makes its claims on open space and consequently on natural features such as rivers and wetlands and that steps should be taken to halt this process.

With land equalling wealth, developmental pressures on these areas are growing. From a once large, pristine, inter-connected system, stretching from Rietvlei, via Milnerton lagoon and Paarden Island wetlands, to the study site and through to almost the steps of the Castle, we are left with the present meagre, polluted, threatened and

degraded remnants. This sequence of events clearly illustrates the consequences of these succeeding generational demands.

With the formulation and discussion of the concept of inter-generational equity, increased knowledge and world trends in environmental awareness, we can perhaps look forward to a period when these remnants will receive greater protection and even rehabilitation.

3.2.8.2 Flooding in the study area

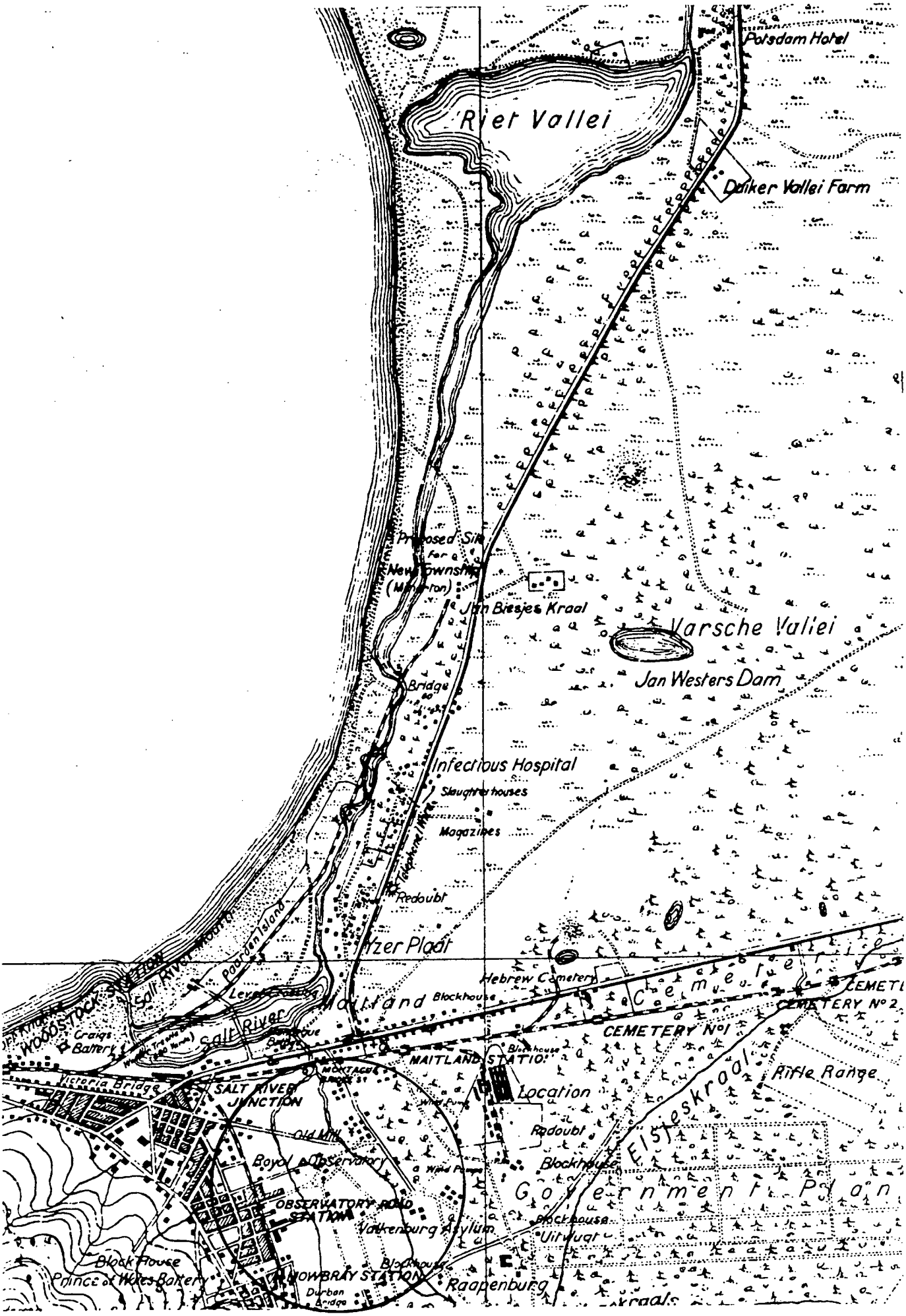
As detailed in the Baseline Information Document (p20), flood lines clearly demonstrate that most of the study area is susceptible to flooding and that areas not affected, already have distinct land usages. A prerequisite to the redevelopment of the area as a built environment would require the relocation of the current land uses/owners.

The approach of this study is based on the assumption that there are no inherent constraints to the development of the area which cannot be overcome by either engineering intervention or by the application of financial means. The whole area could be transformed in much the same way as was done to the foreshore and the Salt River Vlei, through the use of infill to elevate the land out of the current flood plain. Concrete canalisation and the abolition of certain river courses would help to remove the constraint of flooding.

However it needs to be stated that existing flood lines are not accurate (BID, p19). The five year flood line is inundated, on average, twice annually (pers. observation). As developments take place in the catchment areas, these flood lines will rise. Catchment management needs to be undertaken on an holistic basis and at cross-authority level. These flood levels will be inclined to increase year by year in line with catchment hardening, rendering any steps taken in the study area to soon become redundant/ ineffective.

MAP 7: Water all the way – Salt River to Riet Vallei.

From Cape Town City Archives.



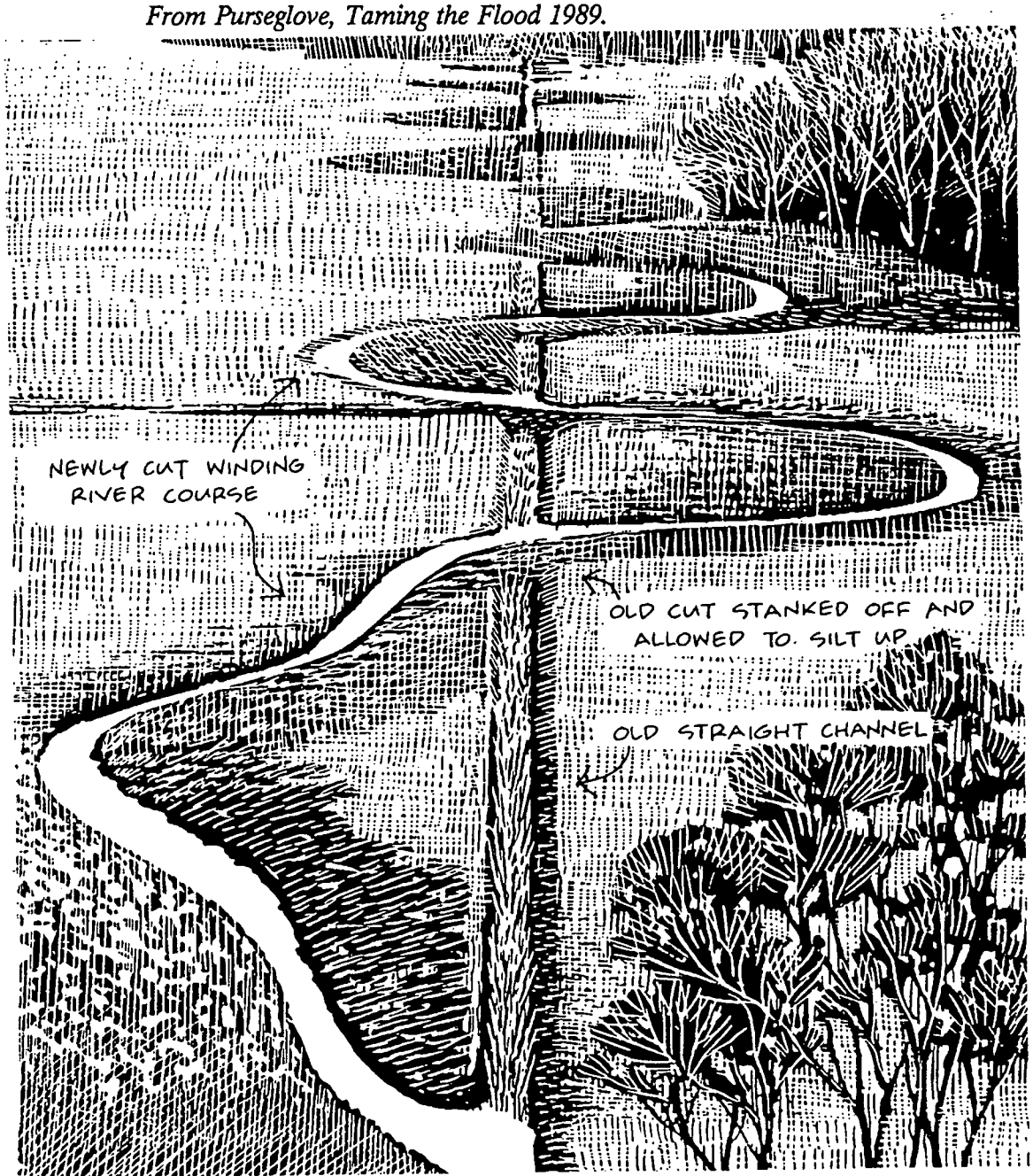
3.2.8.3 Canalisation and river widening

The current approach to channelise and widen the rivers in order to attenuate the effects of flooding, is meeting with increased professional and public resistance (Davies and Luger, 1994). It is regarded as;

- an expensive process
- ecologically damaging
- visually unattractive
- unneighbourly, as it merely passes the problem downstream.

FIGURE 1: Corrective design for earlier channelisation.

From Purseglove, Taming the Flood 1989.



The negative effects of canalisation are well documented and contribute to the loss of animal and plant diversity as well as having a lack of recreational amenity (Davies and Luger, 1994).

Concrete canalisation costs R200 per running metre for a seven metre wide canal. This amounts to approximately R2 million per kilometre for a 7 metre wide canal. Of this figure approximately 20% is fixed with costs escalating proportionally to width (Arnold, pers comm). The Black River is likely to be widened to a maximum of 122 metres. If it were to be canalised, this would require a concrete canal of approximately 60 metres wide, which would be prohibitively expensive.

Methods of flood control for the Black River, Liesbeek River and Salt River canal area, are currently under re-consideration by the Drainage branch of the Engineers Department of the Cape City Council (Lief, Argus, 5/6/94). Flood lines are being re-examined and proposals for storage attenuation considered.

3.2.8.4 I&AP's views of river widening, channelisation and canalisation

Generally, comments indicated that the above approaches to flood control were not favourably entertained. The exception to this came from the authorities directly responsible for this approach. This can probably be explained in view of the specialist nature of the problem. It is a complex one and one which will need a good deal of research if it is to be adequately addressed.

There was a general indication that channelisation and river widening are more acceptable than concrete canalisation.

3.2.8.5 Alternatives to river engineering

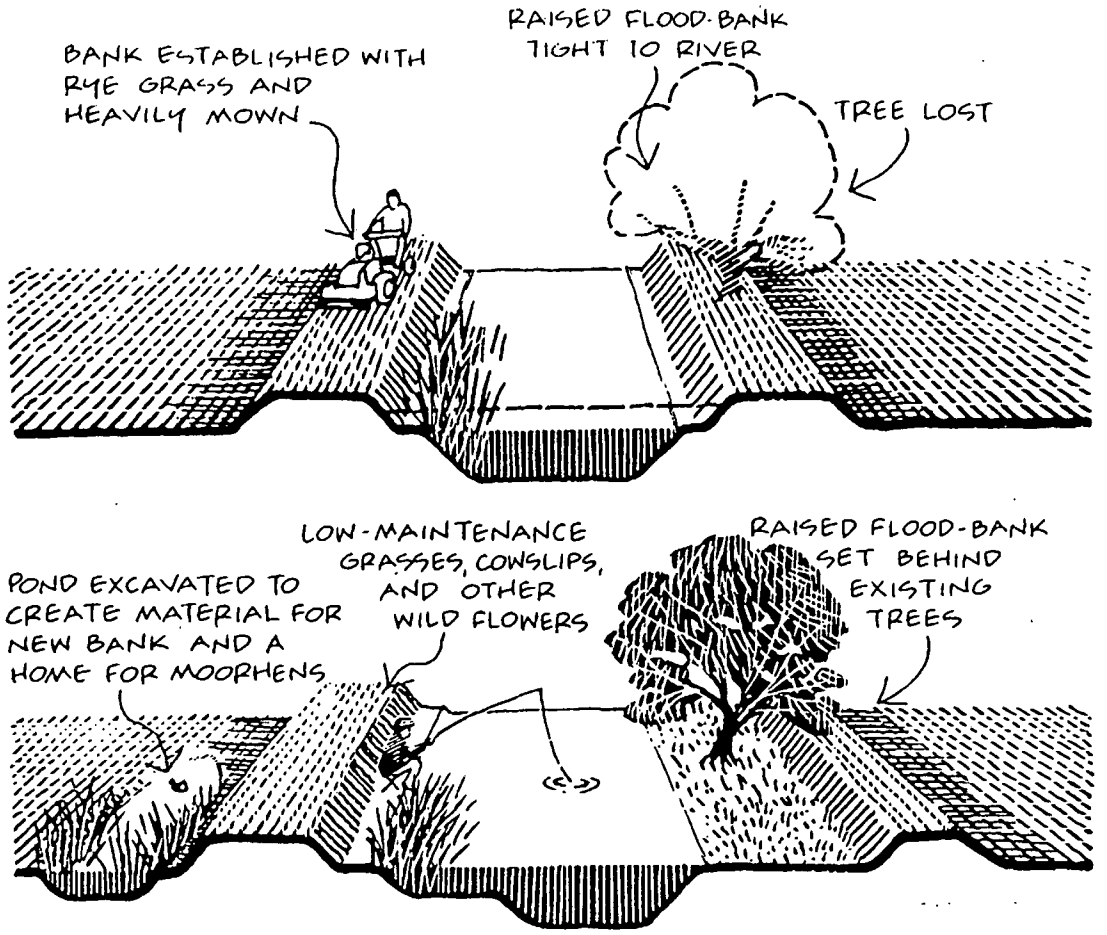
At some time or other, rivers will flood, and if this flooding threatens people or their interests, steps will be taken to prevent this threat. It is accepted that some form of

river management will always be required. What is to be avoided is the approach to flood management which disregards the needs of wildlife.

> "To take this thinking a stage further, there is no need why management for flood alleviation should not positively promote the nature conservation potential of the majority of rivers." (Newbold, Purseglove & Holmes, 1989).

The above authors have investigated many alternatives to river widening and have provided practical illustrations (Newbold et. al.; Purseglove, 1989). Other authors have consistently pointed out the benefits provided by flood plains and wetlands in flood alleviation, water purification and conservation (Rogers & Rogers, 1985; O'Keefe, 1986; Batchelor et al, 1990).

FIGURE 2: Suggestions for alternative designs for river engineering.
From Purseglove, Taming the Flood 1989.

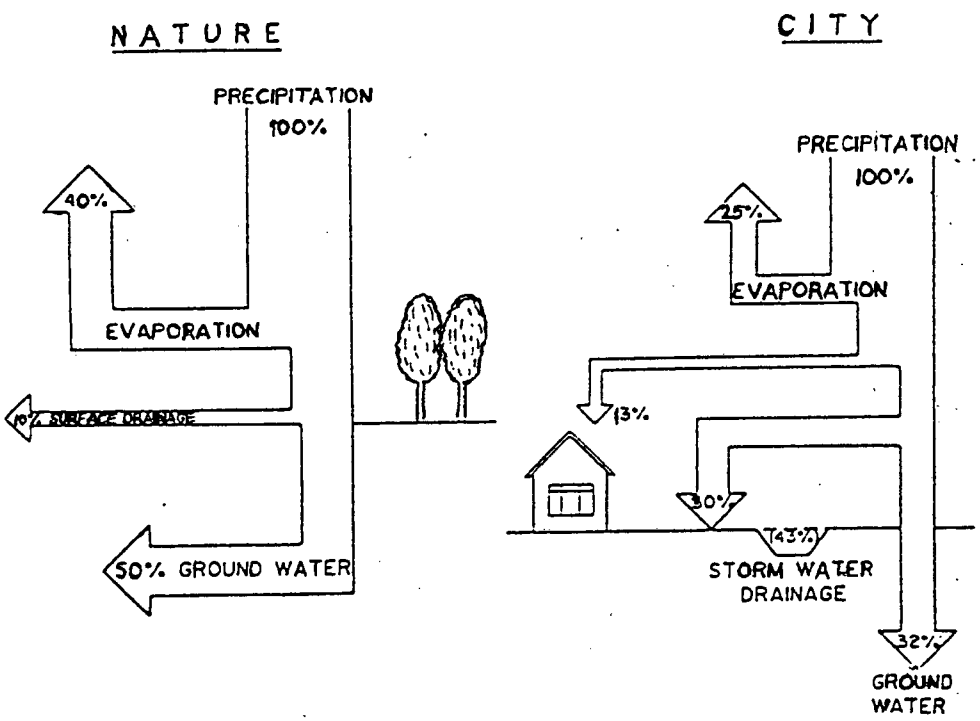


The MOS system proposes a storm water management approach based on natural design principles. Flood plains are reserved for open space uses which allows rivers to increase in width. This represents a storage of excess water until the river channel can once again cope. The vegetation in the flood plain helps to trap silt while absorbing some of the excess water. These factors all act together to slow the formation of a flood peak and reduce the maximum intensity of a flood which in turn results in lower flood lines at bottlenecks.

It is not within the scope of this report to investigate all possible alternatives to the river widening proposal but suffice to suggest that it is no longer considered an optimal solution to the alleviation of flooding.

FIGURE 3: Comparison between the water balance of a city and the natural environment.

From Hugo and De Villiers 1988.



Other authors have looked at source control as a possible approach to the problem (Luger and Davies, 1994). The suggestion here is that measures be introduced at the design stage of a potential development to deal with that developments own run-off.

This issue is particularly relevant to the present case study, as it is contended that new developments within the catchment area are contributing to the increased flood risk. Such measures as permeable pavements which allow rain water to soak away, down-pipes from gutters which divert clean water to lawns or soak-aways and parking areas which allow storm water to be stored above ground, are a few of many examples of what need not be costly innovations, introduced as building regulations.

Current legislation which places no requirements on upstream authorities to deal with storm water run-off, in a way which will not adversely affect down stream activities, is in need of urgent revision. If revision does not take place while catchment areas are undergoing development and is left until this process is complete, the implementation of these catchment recommendations will become much more difficult and could even result in the loss of a valuable opportunity.

These steps involve:

- encouraging the retention of storm water in the catchment area for as long as possible resulting in a slow release of the run-off into the river system,
- porous car parks,
- detention ponds,
- soak-aways for large industrial and commercial developments,
- rates rebates for individual householders who instal water tanks or divert roof run-off into gardens or water features.

These are just a few examples of what can be done in conjunction with an educational and incentive programme. The advantage of legislating such measures, would be a resultant reduction in cost for the authorities, in terms of flood attenuation.

This, however implies a willingness on the part of the authorities to relinquish old approaches/ideas to storm water management. The institution of these catchment ideas would require the initiation of an educational programme, involving all the major role players from the relevant catchment areas, to examine the potential for such an approach. It seems that initiatives in this regard have lately been instituted by a major

engineering firm, the Freshwater Research Unit, the Cape City Council and the catchment authorities (Luger, 1994 pers. comm.). The United Nations blueprint for the environment sets out principles for local government initiatives in support of Agenda 21 and one of the objectives is that "local authorities should have increased levels of co-operation and co-ordination with the goal of enhancing the exchange of information and experience among local authorities" (see appendix 2). This is one facet of cross authority co-operation which could be in place by the goal date of this year.

3.2.8.6 I&AP's views on catchment management

There was unanimity that catchment management for the Liesbeek and Black Rivers should be introduced. This would create an opportunity to address a broad spectrum of issues from hardening, holistic management, systems approach, siltation litter, water conservation, education and the possibility of the creation of a single authority.

3.2.8.7 Waterlogging

Although flooding is perceived to be a problem in the confluence area, examination of the facts shows that no real adverse effects are currently experienced in the study area, besides for the Liesbeek Recreation Centre where fields are flooded approximately twice a year for a period not exceeding 12 hours (personal observation). No roads have ever been inundated in the study area, no wash-aways have been experienced, no loss of life has resulted and no loss of income or work projects have resulted from flooding (Arnold, 1994 pers. comm.).

The main problem areas, due to flooding, occur further downstream in the Maitland commercial areas, where water sometimes rises to floor level. This problem has been temporarily resolved with the installation of pumps to remove flood water into the Salt River canal (pers. comm. Arnold).

Problems in the study area are limited to waterlogging which is caused by a combination of rain and the high water table, something which will not be resolved by

flood attenuation practices (Arnold, 1994, pers. comm.). Waterlogging occurs naturally during the winter months and affects all low lying land in the study area, including the Malta Park Sports Grounds. Waterlogged land can be drained if there is sufficient slope, but at or near to sea level, this becomes more problematic.

PLATE 1: Waterlogged sports fields in the study area.

3.2.8.8 Water pollution/sewage

The rivers which run through the area are polluted, primarily by treated sewage from the Athlone and Borcherd's Quarry sewage works and street born storm water, which lead respectively, to nutrient enrichment and to trace metal pollution (BID, p38). Efforts need to be made to institute measures which will lead to the attenuation of pollution, if other than existing uses for the rivers are to be considered. Approaches which will help to achieve this end include: treating sewage effluent to a higher degree of acceptability, and an educational drive on the authorities, residents and industry to reduce the pollutants washed from roads and gutters during storms.

Political will is necessary to improve the quality of the water in both the Black and Liesbeek Rivers. Revenue will have to be set aside to achieve this end. If the City is unable to do this, then private sector involvement should be encouraged.

PLATE 2: Pollution of the Black River in summer.

The cleansing benefits offered by certain types of aquatic vegetation are well documented (Bachelor et al, 1990), and efforts should be made to incorporate these features into the river and catchment systems, where desirable, in order to help improve water quality, which ultimately effects the marine environment around the Peninsula.

However, the problem of pollution in Table and False Bay, can ultimately only be addressed by improved sewage and storm-water treatment. Research and design information exists on methods to attain this end and this would need to be thoroughly investigated and applied. As long as the urban rivers are used as conduits for sewage

and storm-water disposal, they will remain polluted. The degree of pollution will depend on the effectiveness of the methods employed in its treatment.

3.2.8.9 I&AP's views on water quality and river management

There was general agreement that river management should be improved on an holistic basis. River issues were found to be one of the most dominant concerns. No group or individual suggested that the current status of river management was adequate (BID, app17, table18).

Water quality was seen to need improvement and suggestions included identifying the source of pollution and addressing it at that level. Biological control to improve water quality was also suggested as well as the cleansing attributes of certain vegetation types. Other suggestions for improving the situation involved the upgrading and servicing of townships to reduce the level of pollution.

3.2.8.10 Solid pollution

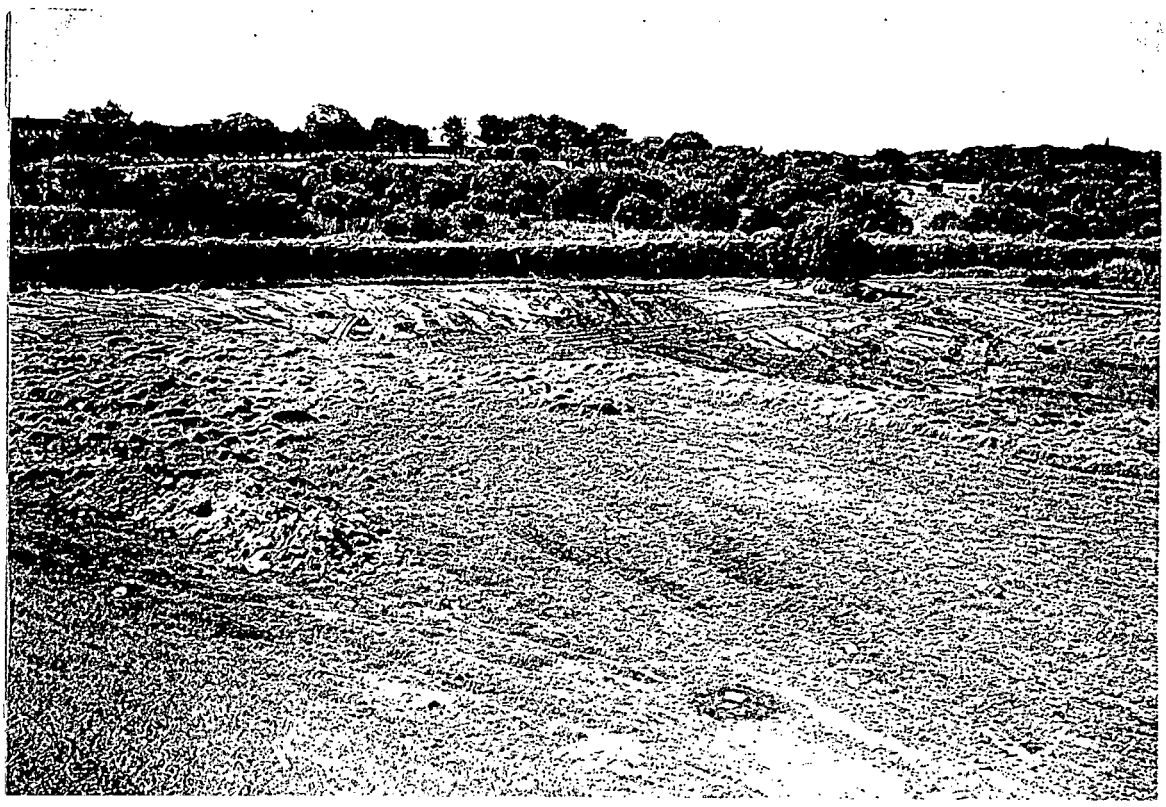
Solid waste is blown and or dumped in the rivers and the resolution of this problem will require a long-term educational drive via schools. The assistance of the media and the cooperation of the packaging and retail sectors will be necessary to address consumer habits as well as proactive intervention on the part of the authorities.

The dumping of domestic waste and builders rubble in or on the banks of the rivers is a common problem. This happens in quite specific areas:

- alongside the Black River Parkway below the bridge which connects west Valkenberg with its eastern campus
- near the footbridge which crosses the Black River and
- on the berm of the Valkenberg Wetlands.

- in the bins provided around Hartleyvale weir, which are inadequate for the volume of people who use the area.

PLATE 3: Dumped builders' rubble below Valkenberg bridge.



It has been suggested that "Wasteaway" type skips be placed strategically to prevent this dumped material entering the rivers. The cost of providing the skips might result in a saving on the labour required to clean up such dumped material and transporting it to the nearest official dump which is about 15 kms away from the study area.

Experimentation with various types of litter traps is required to help address the problem of this type of pollution ending up on the Peninsulas beaches. The debris strewn Milnerton Beach is a classic example of river born solid waste affecting the coastline.

PLATE 4: Solid waste trap on the Black River.

This plate shows solid waste which has lodged itself against a pipe which crosses the Black River below the Peninsula Golf Driving range in the study area. This happens when the water level reaches the height of the pipe during flooding.

3.2.8.11 Alien aquatic vegetation

The dense growths of alien aquatic weeds on the banks and floor of the rivers is seen to exacerbate the flooding problem, however they do serve a valuable function in the form of habitat and food for birds and aquafauna. The ideal would be the eradication of the invasive alien vegetation types and their replacement with non invasive

indigenous types, which would also assist to bind the banks and river floor more effectively, resulting in less erosion and siltation.

PLATE 5: Old Liesbeek choked with water hyacinth (Eichhornia crassipes).

The constant disturbance caused by the cleaning of the rivers with draglines, paradoxically encourages the growth of this alien vegetation which favours such disturbed conditions.

Indigenous vegetation, for example, Palmiet reed, is slow growing and needs a long undisturbed period before becoming effective. Use could be made of this opportunity to create employment through labour intensive methods to re-establish indigenous vegetation and control alien weed growth.

3.2.8.12 Siltation

Siltation of the rivers is an additional problem, the resolution of which could involve further educational initiatives in the form of publications directed at developers and

householders, explaining the advantages of ground cover and appropriate vegetation types within the catchment and along the river courses, especially in those areas identified as significantly contributing to the problem. Engineering solutions in the form of silt traps could also be employed.

3.3 ASSESSMENT OF THE BIOLOGICAL ENVIRONMENT

3.3.1 AVIFAUNA

3.3.1.1 History of the avifaunal habitat

Parts of the study area are recognised as remnants of a once extensive wetland system which extended along the Table Bay coast (BID, p57). These wetlands and the surrounding land have be converted to built form with devastating effects on the wildlife and ecosystems which prevailed for countless preceding centuries. In addition to the loss of an opportunity to study such areas scientifically, this also raises strong ethical and moral questions regarding the right to life of other species. The BID (p57) has briefly outlined the historical sequence of events which has led to this habitat loss.

It is recognised that migration routes are inculcated into the make-up of the birds which undertake these mammoth journeys. The exact mechanisms used by migratory birds is the subject of experimentation and research. Suffice to say that these mechanisms are fine tuned over eons and are adapted to fit in with a certain niche in the biosphere.

Research has suggested that animals forced out of their territories, find it difficult to find alternative sites due to the unsuitability of other habitats or as a result of competition from existing occupants, often resulting in the demise of the displaced population (Turpie, pers. comm.).

PLATE 6: **Aerial photograph from 1934 showing the extent of wetland which existed in the study area.**

3.3.1.2 Diversity of avifauna

The BID (p42) concludes that the diversity of the avifauna found in the study site compares favourably, and even better in some cases, with that of Rondevlei and

Rietvlei. However, the total number of birds involved does not make the site of national or regional importance, although it does signify local importance. The loss of these remnants, of a once extensive habitat, may be critical for the survival of long distance migrants, which come to the same area annually. This makes the area not only locally important, but also internationally significant.

Different species require each other in order to set up a food chains. Therefore species richness, and not just the total number of birds, is an important indicator as to the health of the ecosystem. Turpie (1994) points out that despite habitat modification and degradation, the study area is still a relatively rich avifaunal habitat.

3.3.1.3 Waterbirds

Turpie (1993) maintains that the general importance of the study site should be stated in terms of the wetland avifauna (BID, p 38). This cannot be denied as the rivers and wetlands provide a valuable habitat. However, it is not only the wetlands which provide the key to the species found in the study area. A combination of factors are important.

- the remoteness and low disturbance of the area
- the openness of the surrounding fields
- tree groves on high ground
- siltation resulting in shallow rivers
- slow moving water (eutrophication)
- the availability of nesting sites in the surrounding area.

The species diversity could be affected if any one of the elements found in these lower reaches of the rivers is removed, as would be the case were development to take place.

PLATES 7 & 8: **Raapenberg Bird Sanctuary in summer and under flood.**

Turpie (1994) points out that three Red Data species have been recorded in the Black River wetlands. Of the three, the White Pelican is the most regular visitor with numbers reaching 12 or more. She also points out that the area

> "supports some species whose numbers are declining in the southwestern Cape, mainly because of the depletion of wetland habitats. These include Purple Heron, Hamerkop, African Marsh Harrier and Ethiopian Snipe." (Turpie, 1994).

Turpie also points out that the area is an important movement corridor for seasonal, as well as daily movement.

During times of gale-force south-easterly or north-westerly winds, the flight patterns of the birds, which use the study area as a movement route, alter. During fine weather, the early morning and evening movements of birds takes place at a high altitude. This phenomena is completely reversed during these gale-force winds. The Hartlaub's and Kelp Gulls movement takes place, virtually at ground level, as they use every contour available to reduce the negative effects of the winds.

This fact needs to be born in mind if redevelopment is decided on for the study area. The birds which move through the area prefer uninhabited areas as movement corridors as they area then able to fly closer to the ground in bad weather.

3.3.1.4 Terrestrial Birds

An analysis of the species check-list provided by Turpie indicates that of the 121 species found in the area, 52 (or 41%) of them are terrestrial species. This is a significant percentage! Admittedly, some of the species make use of both the immediate wetlands and surrounding area, but others such as Steppe Buzzards, Black Shouldered Kite, Red Breasted Sparrowhawks, Spotted Dikkop, Crowned Plover and Doves and others, have no essential relationship with wetlands as such, and are usually shy, open field species, easily put to flight.

The BID (Appendix 18) states that an additional study to determine the composition, distribution and habitat preferences of the terrestrial bird species is required. The City Planners Department, via the Nature Reserve Advisory Board (3/3/94) maintained that such a study was not

> "a priority; however the C-BR area should be carefully managed with reference to the management recommendation contained in the above report (ie Turpie)".

Turpie recommends that some core areas should remain inaccessible to people and that

> "buffer areas are essential. It is recommended that at least a 150m terrestrial fringe on the eastern shore of the Pallotti wetland be retained and managed for this purpose, within at least 50m of which public access is limited, and a similar buffer around Raapenberg North should be retained." (Turpie, 1994).

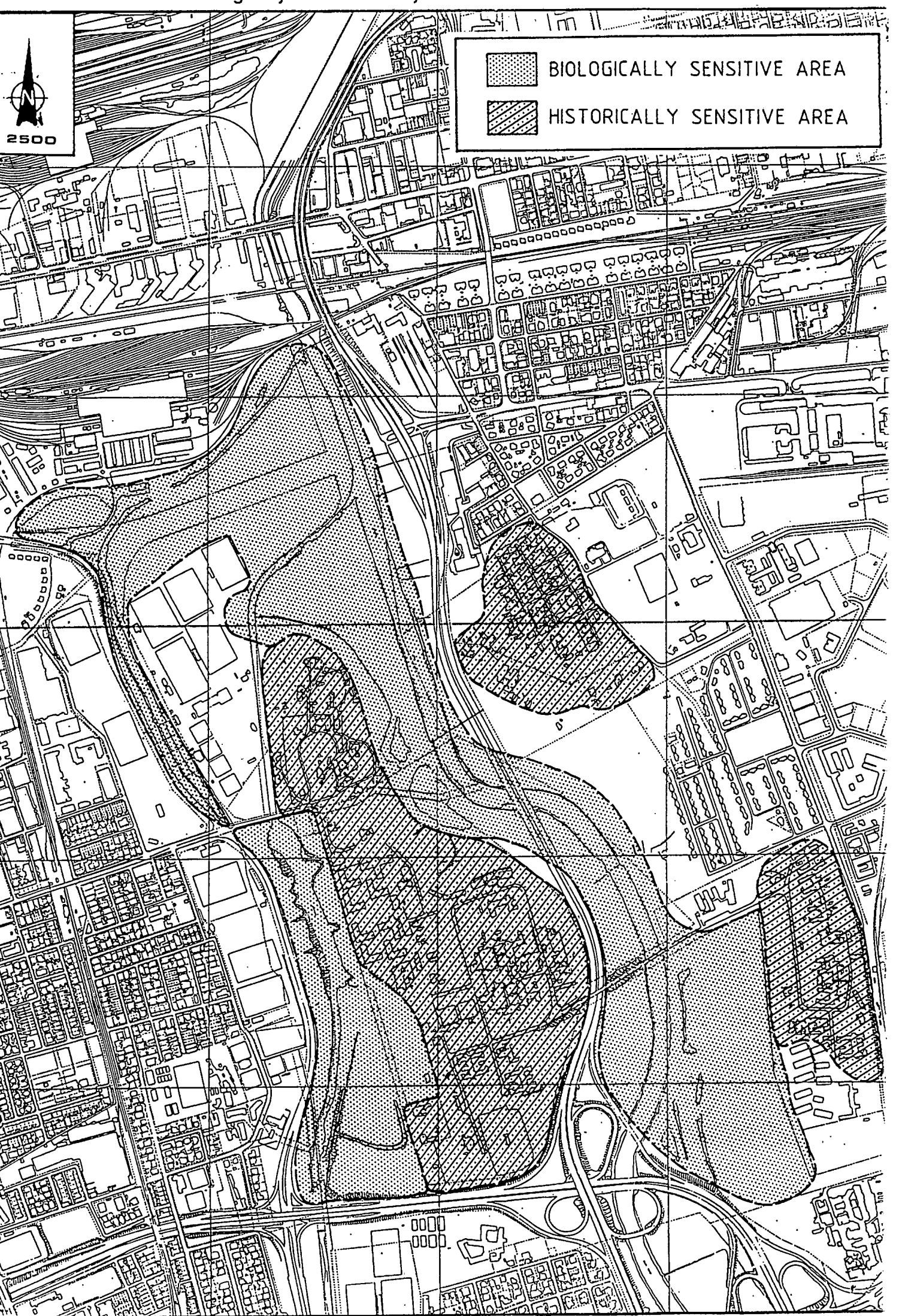
In view of the approach adopted in this report, the diversity of the bird population is of great importance if the area is to be successful as a tourist and recreational resource for the city.

Turpie's Report (1994) notes the presence of terrestrial birds but a thorough investigation of their habitat preferences was not undertaken. She notes:

> "The remainder of the area contains buildings, roads, gardens and fields. The buildings of the South African Astronomical Observatory (SAAO) and Valkenberg Hospital are surrounded by lawns and exotic tress (mainly eucalypts), and acacia infestations occur throughout the field adjacent to the Pallotti wetland and Varsvlei. Many terrestrial bird species are found and breed throughout most of these areas.
>
> ....Areas with taller gums and acacias support Spotted Eagle Owl, Barn Owl, Klaas's and Diederik Cuckoos, and breeding Pied Crows and Blackshouldered Kites. Redbreasted Sparrowhawks and migrant Steppe Buzzards also hunt frequently in the area." (Ibid)

Future development in the area might lead to fragmentation of this terrestrial habitat, and increased human presence could have a detrimental effect on the terrestrial avifaunal composition.

This dissertation maintains that the general biological importance of the study area should be stated in terms of both wetland and terrestrial avifauna.


BIOLOGICALLY SENSITIVE AREA
HISTORICALLY SENSITIVE AREA
2500

3.3.1.5 I&APs Views on Conservation

There was little disagreement about the conservation worthiness of the confluence area with only three comments contesting this. Thirteen comments indicated that the Confluence area is of conservation significance with a further thirteen comments being neutral, which did indicate that the study area needs to be better managed to, improve its conservation significance (BID, app17, table 16).

3.4 PRESENT OPEN SPACE

3.4.1 RIVERS

The water courses and their flood plain constitute the largest undeveloped area within the study area.

3.4.2 SPORTS FIELDS

The BID notes that there is a high proportion of sports facilities of local and metropolitan importance (BID, p69) to be found in the periphery of the study area. These include the Hartleyvale and Malta Park sports complexes as well as a swimming pool and Bowling greens which lie west of Liesbeek Parkway. The report concludes that in combination with the passive recreational opportunities offered by the study site, there exists an opportunity to transform the area into a major recreational area for Cape Town. This would be possible if the constraints placed on accessibility by current landownership were lifted.

In addition to the Sports facilities at Liesbeek Park Recreation Centre, Valkenberg Hospital has a Bowling Green, a cricket field, a soccer field and an additional piece of land which has been levelled for such use. The Alexandra C&RC has a large sports field while the Peninsula Golf Driving Range is to be found within the study area.

As much of this sports orientated infra structure already exists, converting the area into a major recreational centre for the Cape Metropolitan area need not be an expensive project, merely requiring up-grading. Since the land already mostly belongs to the public, large capital requirements will not be necessary for its acquisition.

3.4.3 THE LACK OF BUILT FORM IN THE STUDY AREA

Existing buildings in the study area have a unique character and are sparsely situated, offering a great deal of variety, from functional dormitories to historic buildings of great character and architectural diversity. The views from the site are exceptional and offer great scope for the creation of public facilities such as restaurants, tea rooms, lecture theatres, indoor sporting complexes and hostels.

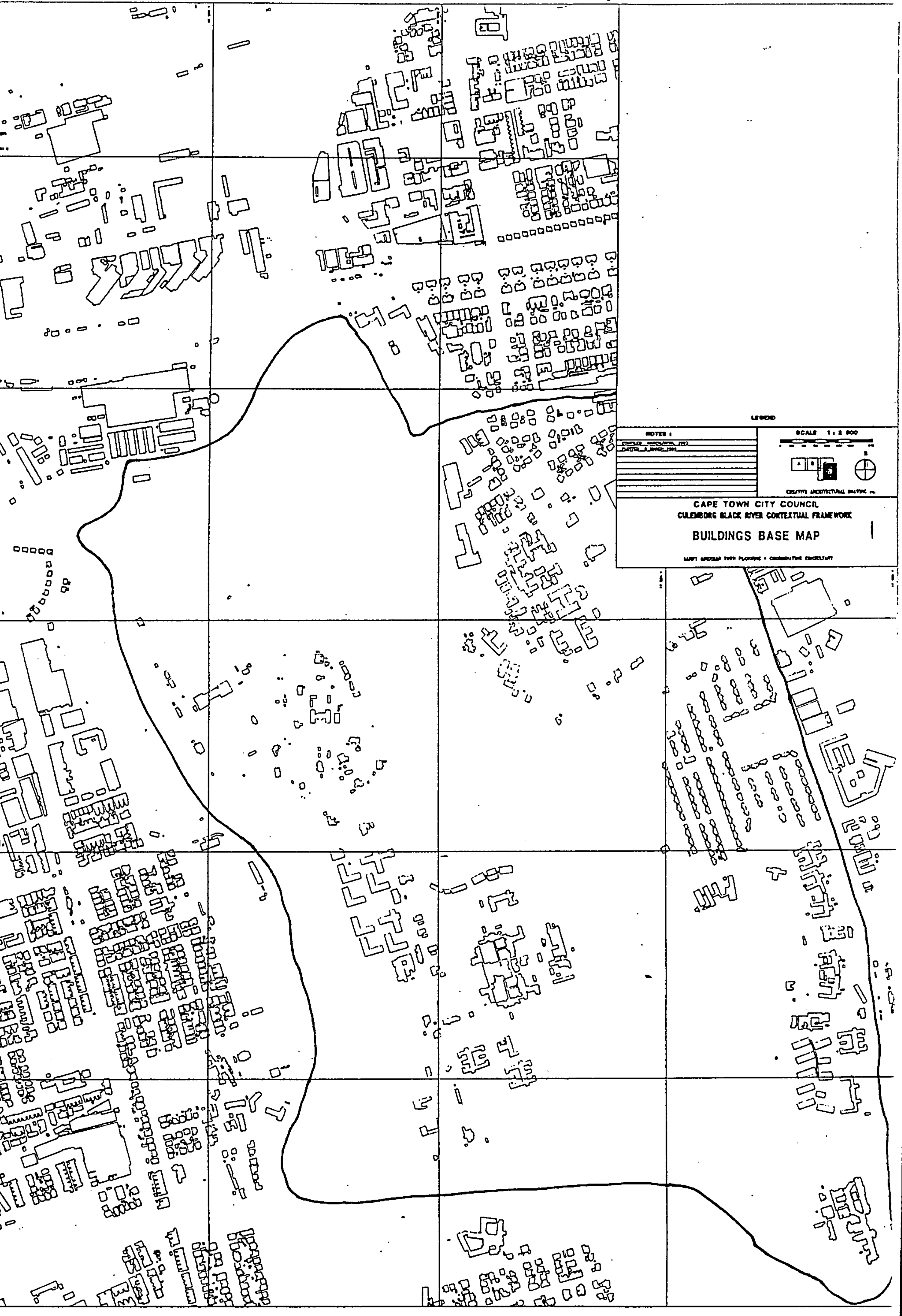
Due to the sparsely built form, traffic is minimal making the area ideal for cycling, jogging and walking.

The study area as it exists, can be regarded as a large "open space". If one compares the approximate 1.2 km width of the property with the density of the built environment within 1.2 km of its borders, the study area clearly has much less built environment than the surrounding area.

The number of people housed in the study area during a 12 hour daytime period is approximately 4310, and with a figure of 3500 for a 12 hour night time period. Within a 1.2 km radius of the borders of the study area, daytime figures are impossible to calculate, but nighttime figures should approximate the surrounding population figure of 38000 (See map no 9, showing the built form). These figures exclude the suburbs of Pinelands, Rondebosch and Mowbray.

From the map and the figures, we can see that the surrounding areas are significantly more built and inhabited. An analysis of the avifauna within the same radius finds that the study area of 232 ha supports 121 species, whereas the surrounding two kilometers yielded approximately, 20 species (Personal observation).

This map shows the lack of built form in the study area.



The C-BR Stage A and B Reports, demarcate the three major Institutions in the study area as "Institutional Open Space". This confirms the assessment of this dissertation that the study area, in conjunction with the other land parcels and facilities in the area, represents an open space of significance for the southern suburbs.

A breakdown of the extent of land parcels in the area follows. They are approximate and are expressed as hectares:

TABLE 4: Land parcel sizes within the study area.

Varschvlei dump	=	6.3
Liesbeek Sport ground	=	13
S.A. Observatory	=	9.8
Raapenberg Bird Sanctuary	=	15.2
Valkenberg Hospital	=	44.4
UCT owned land	=	3.4
UCT leased land	=	0.5
National Monument Council	=	1.15
Gateway Park	=	1.6
Alexandra Hospital	=	27.1
Vincent Pallotti (V.P.) Hospital	=	4.7
Open Field above V.P. Wetlands	=	10.1
Maitland Garden Village	=	14.0
Maitland residential area	=	8.0
Other residential land	=	2.5
Golf Driving Range	=	5.1
TOTAL	=	**166.8 ha**
City Council land and roads	=	65.2
TOTAL FOR STUDY AREA	=	**232.0 ha**

An analysis of the different land parcels in the study area indicate that the total is approximately 232 ha. Of this approximately 140 ha (60%) is undeveloped, 30 ha (13%) is built while the rest is City Council land, which is mostly undeveloped but does include roads. This totals approximately 65.24 ha. (28%).

From the preceding information, we can ascertain that about 200 ha of the 232 ha is "open". This is about 86% of the area.

Of that figure, approximately 109.8 ha (47%) is flood plain or riverine land and consequently undevelopable. Most of the rest of the land has a current use. The only areas which are currently vacant and developable are the eastern campus of Valkenberg Hospital, the golf driving range and the Vincent Pallotti "field".

3.4.4 I&AP'S VIEWS ON OPEN SPACE

Three main viewpoints were ascertained from the responses of the groups consulted. These were expressed as questions in the BID (app. 17, table 14).

- *"Is open space an appropriate form of land use in the confluence area?"*

This question elicited ten supporting comments, two opposing and six neutral. These conflicting responses indicated that there are two broad visions for the area. The one group believe that the area should remain largely unchanged, remaining mainly as open space. Opposing this view was a group who felt that some form of development would be acceptable in certain parts of the area. "None of the I&AP's believed that the confluence area should be developed at all costs." (BID, p119).

- *"Is there a need for improved management of open space in Cape Town."*

This question elicited 5 supporting comments with two neutral statements.

- *"Should the confluence area be included in a broader metropolitan open space system?"*

Eight supporting, one opposing and four neutral comments were obtained. The consensus was that the largest part of the area should remain as open space (Ibid).

3.5 CONCLUSIONS OF THE ASSESSMENT OF THE BIO-PHYSICAL ENVIRONMENT

Physically the study area has been shown to hold opportunities for its multi-purpose use. Low lying wetland areas and high-lying dry and buildable land, are to found in the area, thereby offering a great variety of potential uses.

It has been shown that the study area is adversely affected by noise and air pollution and wind. These natural constraints can be overcome through the establishment of vegetated earth berms and green lungs.

The study area has been shown to hold opportunities for the retention of rainfall on site which seeps into and supplies the wetlands, while soil composition limits buildability to land occupied by existing institutions.

It has been shown that approximately 47% of the study area comprises wetlands and riverine environments and that this constraint can be overcome by engineering and economic means, however, the problem of waterlogging has been shown to be one that will probably persist regardless of methods used to control flooding. Hard engineering solutions to this problem are opposed as they are environmentally destructive and expensive. Catchment management and other alternatives are favoured in order to maintain avifaunal and habitat diversity.

Interested and Affected parties who were consulted indicated that alternatives to the current engineering approach to flood control should be investigated.

Water and river management were discussed and the pollution of the rivers was seen to require a multi-faceted approach. I&AP's confirmed that current river management was inadequate and that the solution to alien vegetation and siltation problems required an holistic approach.

Avifauna was shown to be the dominant ecosystem with the wetlands constituting their core habitat but that approximately 40% of the avifauna have terrestrial habitat requirements. It was recommended that the importance of the study area be stated in terms of both wetland and terrestrial avifauna.

This chapter has indicated that succeeding generations make claims on open space. It has been pointed out that the study area is recognised for its open space with 86% of it being unbuilt. The formal recreational facilities which are to be found adjacent to it, in combination with the study area, represent a recreational opportunity that needs to be promoted. The public consultation process has indicated that most people interviewed supported the use of the area for recreational, open space and conservation purposes.

CHAPTER 4

THE ASSESSMENT OF THE SOCIO-CULTURAL ENVIRONMENT

4.1 INTRODUCTION

This section of the dissertation aims to outline the significance of the study area from a colonial and pre-colonial perspective. Some theoretical examples will be cited to underline the importance of retaining the historical character of buildings and areas.

It will be shown how the privatisation of state owned National Monuments, leads to their loss as public facilities and erodes their original character.

In the future, with increased populations in the urban areas, it is suggested that the significance of the confluence area will grow in importance. Active and passive recreation are also addressed in relation to present and future needs.

The views of the I&AP's are presented and discussed throughout the chapter.

4.2 AN ASSESSMENT OF THE HISTORICAL AND ARCHAEO-LOGICAL ENVIRONMENT

Historical significance does not rest in one feature or another, it is composed of many features, which go together to create a sum greater than the individual parts.

The confluence area has an historical link with nature, which is still evident, although somewhat attenuated. Most of the major African animal species, and some now extinct species, had been recorded in the area (Thom, 1953). For this reason, amongst others, the rivers and water bodies require an approach which is more than merely functional, giving credit to intangible feelings and "character".

The pre-colonial significance of the area for the Khoi and San is well documented in van Riebeecks diaries (Thom, 1953). They were firmly entrenched in the area and it was a popular seasonal grazing area for their many sheep and cattle as well as a rich hunting ground. This significance will grow in importance for the future inhabitants of the country, if some of it is preserved to illustrate the features which drew the original inhabitants here.

Due to its topographical elements, it was the site of much pre-colonial habitation and many site of archaeological significance remain to be identified. It has been recommended by Hart (BID, chap.5) that an archaeologist be present at any excavations which take place within the study area.

The significance of the local rivers as the original boundary of European settlement is well documented and also was the site of conflict between the original inhabitants and the European settlers.

Whether the study area will be perceived to have positive or negative connotations by the new Government, remains to be seen, but given the current approach towards National unity, colonial history is likely to retain its significance.

With the thrust towards densification of the residential component of the city, pressure will be brought to bear on the historical character of the area, in its built form, as well as on its natural history. The Council for the Environment (1989) points out that:

> "The character of the city/town or its components must determine and describe because that is the basis on which the environment is developed. Historical background, inherent qualities and present functions will play a conclusive role" (p5).

The sale of the large State facilities, to help finance the restructuring within South African society, is likely to impact negatively on their historical conservation. The sale of these facilities will lead to the fragmentation of the sites, the alteration of the buildings, and to the erosion of their spatial characteristics.

The historic settler homes within the context of the study area, have been lost to the public. Coornhoop and Westoe are private and hidden behind high walls and amidst residential development. Woolsac is no longer known for its homestead, nor is Welgelegen. These UCT holdings are lost as privatised entities. If the public ownership of the study area goes, so will its historic character. The approach adopted with Groot Constantia, where it has remained a working historical farm precinct, has proved very successful and it is one of Cape Towns major tourist attractions. This option is no longer available for the Valkenberg Homestead. The farmstead character of the complex, adjacent to open fields and river, as stated previously, is lost forever.

> "Visual characteristics such as scale, building heights, facade .." etc, ... while "All natural elements in the city environments such as wetlands, streams and ridges must be identified and incorporated along with urban parks, nature areas and green areas in an open space plan.." (Ibid p 5).

PLATE 9: Valkenberg Homestead.

A sense of historical evolution is important from a psycho-social point of view, assisting society to adapt to change. Too rapid a change in the restructuring of society can lead to confusion, fear and a feeling of alienation.

It will be necessary to find a harmonious use for the existing structures, which will allow them to be used by a much greater number of people, without destroying their character, as has happened with the Courtyard project. The farmyard ambience of the Valkenberg Homestead has been altered by the construction of this high density residential facility. The thrust towards town house design will inevitably lead to an incremental destruction of any sense of historical significance.

> "Preservation of cultural historical elements contribute much to the character formation of a town or city... In the structure plan aspects such as re-use and rehabilitation of buildings .. must be dealt with" (Ibid p 5).

If the historical and cultural fabric of the study area is to be conserved, an holistic and integrated approach must be adopted. The ad hoc nature of development, as illustrated by the Courtyard development, where individual needs were satisfied to the exclusion of others, must not be allowed to happen in the future.

4.2.1 I&APS VIEWS OF HISTORICAL AND CULTURAL ISSUES

The views of most of the I&APs is that the area contains much of historical and cultural value and that this fact should be reflected in any future development. The character of the study area is reflected in the architecture and the relationship between the buildings giving a feeling of space and ruralness.

The comments and observations of the I&APs are unanimous in their concern for the current approach to the conservation of the study area's historical and cultural conservation worthiness (BID, app.17, table 17). The consensus is that not enough attention and resources have been allocated for this purpose.

There is virtual unanimity regarding the historical and cultural significance of the study area. Affected parties are generally agreed that these aspects of the study site should be made more accessible to the public while retaining their character.

4.3 LOCAL DEMOGRAPHY

Statistics regarding the demography of the suburbs of Pinelands, Mowbray and Rondebosch have been left out of the BID, but have a strong bearing on the study area. Unfortunately, these suburbs, as with the ones covered in the BID have all been severed from the study area with the construction of the surrounding road system (BID, p60). These constraints to pedestrian access could be removed if there is a will to do so.

The importance of the study area to these omitted areas, must not be underestimated, in view of the move towards densification.

4.3.1 JOB CREATION

The area around the C-BR has the highest concentration of employment opportunities in metropolitan Cape Town (BID, p63). This is of significance for the study area as it forms part of this greater area. This fact would imply that there was not much need for more employment opportunities in the area but rather a need for accommodation and recreational opportunities.

The creation of job opportunities needs to be focused on areas closer to the places of habitation of those requiring it. This would result in less travelling time, with consequent economic and environmental savings/benefits. More job creation in this area will simply aggravate the already skewed spread of opportunities.

Travelling time to and from places of work is a major factor in the South African lifestyle. This state of affairs could be manipulated to the communities advantage, if these places of work were located closer to the newly settled areas of Mitchell's Plain, Khayelitsha and Macassar.

4.3.2 I&AP'S VIEWS ON JOB CREATION

There was divided opinion as regards the appropriateness of the study area for job creation. Participants pointed to the need for job creation on a regional basis and some pointed out that if the area was developed as a recreational area, jobs would be created.

4.4 RECREATION

The recreational potential of the study area is recognised by virtually all the documents and planning directives for the Cape metropolitan area. These are covered in depth in the BID (chap. 7). This recreational potential is also highlighted in two other documents: "Planning of Metropolitan Open Space in the Cape Metropolitan Area - Discussion Document" (January, 1994), and in, "A Vision of Cape Town" (Conference proceedings, Josephine Mill, October, 1993).

It is indicative of the lack of attention paid to these documents, by the authorities who produced them, that developmental pressures of a non-recreational form are being brought to bear on the study area! This anomaly needs to be addressed.

4.4.1 ACTIVE RECREATION

The study area offers numerous opportunities for active recreational use. These need to be pursued in conjunction with the land owners and local authorities. The potential for a combined walkway, cycle track and jogging route exists, and a distance of over 10 kms can easily be achieved.

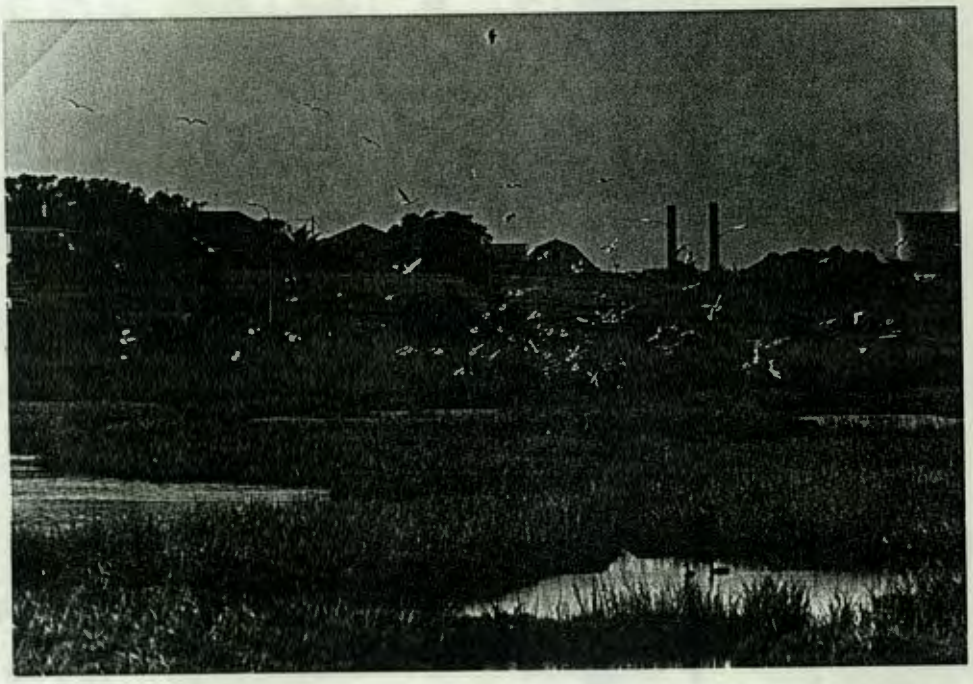
Such a route needs to be identified and developed for this purpose. Valkenberg Hospital has already been used for the purposes of a marathon (Old Mutual) and many people use the area for jogging. Access to the Hospital is possible via a number

of unofficial routes and joggers are not challenged by the security guards at the two official entrances.

4.4.2 PASSIVE RECREATION

Bird watching is one of the fastest growing leisure time activities in the western world. This area is suited to this pursuit, due to its accessibility for the residents of Cape Town as well as a destination for tourists.

PLATE 10: Birds over Raapenberg Bird Sanctuary.



4.4.3 SUMMARY ASSESSMENT

The historical significance of the study area lies in its Colonial buildings and the rivers which served as early boundaries. It is also an area rich in potential archaeological sites. The whereabout of some of these still has to be ascertained.

The existing recreational facilities, supplemented by the large open spaces and avifaunal diversity, holds potential for the development of a local tourist industry. The historical nature of the study area should play an important part in evaluating any future development.

The increasing move towards urban living by the rural population indicates that the demand for recreational space in the greater Cape Town area will increase. A tourist emphasis for the study area could lead to some job creation. The main requirements for the creation employment opportunities, lies nearer to the residential areas of the unemployed.

CHAPTER 5

ASSESSMENT OF LAND USE SUITABILITY

5.1 INTRODUCTION

For the purposes of clarity, this chapter divides the study area into 15 land parcels, or eco-rooms which have distinctive characteristics. These land parcels do not necessarily correspond with land ownership. New and widened roads and river engineering are dealt with separately.

Each eco-room will be described briefly, conclusions drawn, a sensitivity rating given and recommendations made for their use.

5.1.1 SENSITIVITY RATING FOR EACH ECO-ROOM

There will be three categories of rating, low, medium and high sensitivity, which will give an indication as to the importance of that eco-room for the overall **eco-system**, represented by that particular land parcel. Another rating of **historical and cultural** sensitivity will be given to indicate the importance of the buildings and the current human functionality of the eco-room. A third category will pertain to the land parcels importance as an **open space** area.

An example of this system is represented below.

Name of Eco-room	Ecosystem	Histo-cultural	Open Space
Sensitivity	L	M	H

Criteria for sensitivity are given below.

Biological: Explanation of sensitivity

Historical: Explanation of sensitivity

Open Space: Explanation of sensitivity

5.1.1.1 Biological sensitivity is established according to the following criteria.

Low sensitivity is given to an area where there is no useful habitat and where avifaunal species number fewer than 20 species.

Medium sensitivity implies useful habitat with avifaunal species numbers above 20 but below 40 species.

High sensitivity denotes useful habitat e. g. wetlands or riverine habitat, and avifaunal species presence above 40.

5.1.1.2 Historical and Cultural sensitivity is determined by the following criteria.

Low sensitivity denotes buildings lacking historical significance and which are vacant.

Medium sensitivity indicates buildings older than 50 years.

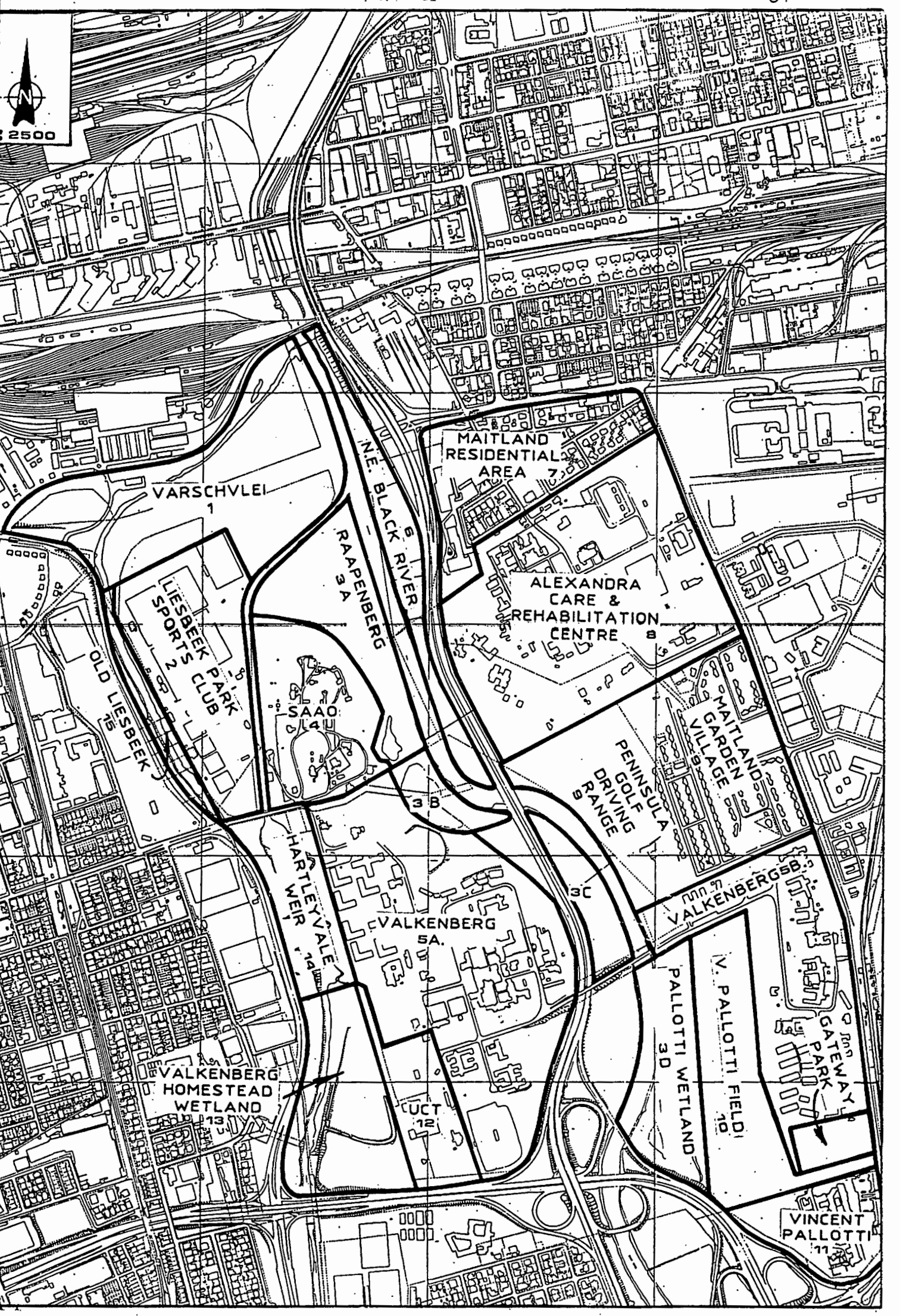
High sensitivity denotes buildings older than 100 years, which are fully occupied, or areas which have special characteristics or potential uses.

5.1.1.3 Open space criteria for sensitivity are determined as follows.

Low sensitivity is indicated by land which is more than 75% developed.

Medium sensitivity applies to land with a 20 - 75 % built fabric.

High sensitivity is land which is less than 20% covered by built form.
Each land parcel will be given a site sensitivity rating which will refer to its overall rating. It should be born in mind that some of the land parcels are large and therefore the rating will be a very general one.


N
1 : 2500
VARSCHVLEI
1
LIESBEEK PARK SPORTS CLUB
2
OLD LIESBEEK
15
N.E. BLACK RIVER
6
RAAPENBERG
3A
SAAO
4
MAITLAND RESIDENTIAL AREA
7
ALEXANDRA CARE & REHABILITATION CENTRE
8
MAITLAND GARDEN VILLAGE
9
PENINSULA GOLF DRIVING RANGE
3B
3C
HARTLEYVALE WEIR
14
VALKENBERG
5A.
VALKENBERG 5B
V. PALLOTTI FIELD
10
PALLOTTI WETLAND
3D
GATEWAY PARK
VALKENBERG HOMESTEAD WETLAND
13
UCT
12
VINCENT PALLOTTI
11

Criteria for overall rating will be as follows:

A high sensitivity in each category will result in an overall rating of High e.g.

H H H = High sensitivity.

Examples of other combinations follow:

H H M = High sensitivity

H H L = Medium sensitivity

M M H = Medium sensitivity

H M L = Medium sensitivity

M M L = Medium sensitivity

5.2 VARSCHVLEI

This parcel of land is positioned at the most northerly end of the study area and is bounded by the "old" course of the Liesbeek River in the north and west, the Black River in the east and the canalised section of the Liesbeek and the golf driving range of the Liesbeek Recreation Centre in the south. It is approximately 6.3 ha in extent, is of an undeveloped character and is in close proximity to the Raapenberg Bird Sanctuary. It is also the proposed site for the Berkely - Malta Road connection.

5.2.1 ASSESSMENT FOR VARSCHVLEI

This site is characterised by the following factors:

- It lies within a former wetland.
- Extensive dumping has occurred which has placed some of the surface area above the 4.6m 1:50-year flood plain.
- It is particularly visible to Cape Town commuters as it lies in an area surrounded by major traffic routes.
- The site is overgrown with alien flora.
- It has developed its own ecosystem and is home to several bird species which nest and feed there.

PLATE 11: The nature of fill at Varschvlei.

The study of aerial photographs of the study area emphasises that this northern end is particularly unbuilt. This site combines with the Liesbeek Park Sport Club and the Raapenberg Bird Sanctuary to form the largest open space in the study area.

One of the main features of this site is its high land value. It is considered prime real estate. However, this is complicated by the fact that the site falls within an ecologically sensitive area and flood plain and that the nature of the infill might not be conducive to human habitation. In the past underground fires have occurred spontaneously on this site (personal observation). Efforts to extinguish burning coal dumps tend to prove difficult and expensive. This issue will need to be addressed.

As this dump has been placed in a water course, it is particularly subject to leaching where the noxious elements are transported to either the ground water reserve or to the sea and Table Bay. Efforts to clean both False Bay and Table Bay, will prove unsuccessful in the long run, unless measures are taken to identify and treat such potential sources of pollution.

Placing the Malta-Berkeley Road connection here would effectively complete the encasement of the entire study area with major roads. In view of its proximity to the Bird Sanctuary this might prove detrimental to the well-being of the avifauna due to possible road kills. This development will aggravate the noise and air pollution in the study area.

This proposed road connection has been assessed as being in need of review by the C-BR study (C-BR, Stage A, app. A). Were it to take place, the relief to current traffic congestion would be questionable as a bottle neck imposed by the narrowness of the road through Salt River would be an additional obstacle to overcome.

Varschvlei	Biological	Histo-cultural	Open Space
Sensitivity	H	L	H

Overall Sensitivity is **High**
Biological: terrestrial avifauna, thick bush, raptors, rodents
Historical: no buildings, remote chance of archaeological sites
Open Space: no buildings

5.2.2 RECOMMENDATIONS FOR VARSCHVLEI

Prior to any development taking place on this site a thorough analysis of the composition of the infill will have to be undertaken.

Due to its position amidst water and the nature of its alien flora, it is effectively helping disperse the seeds of these aliens. A programme of revegetation, using mostly indigenous plants, needs to be undertaken in conjunction with an alien eradication effort.

Although expensive and contrary to the original motivation for the dumping of infill in these wetlands, many examples of restoration and reclamation of derelict and degraded land exist (Bradshaw and Chadwick 1980). In view of the river widening

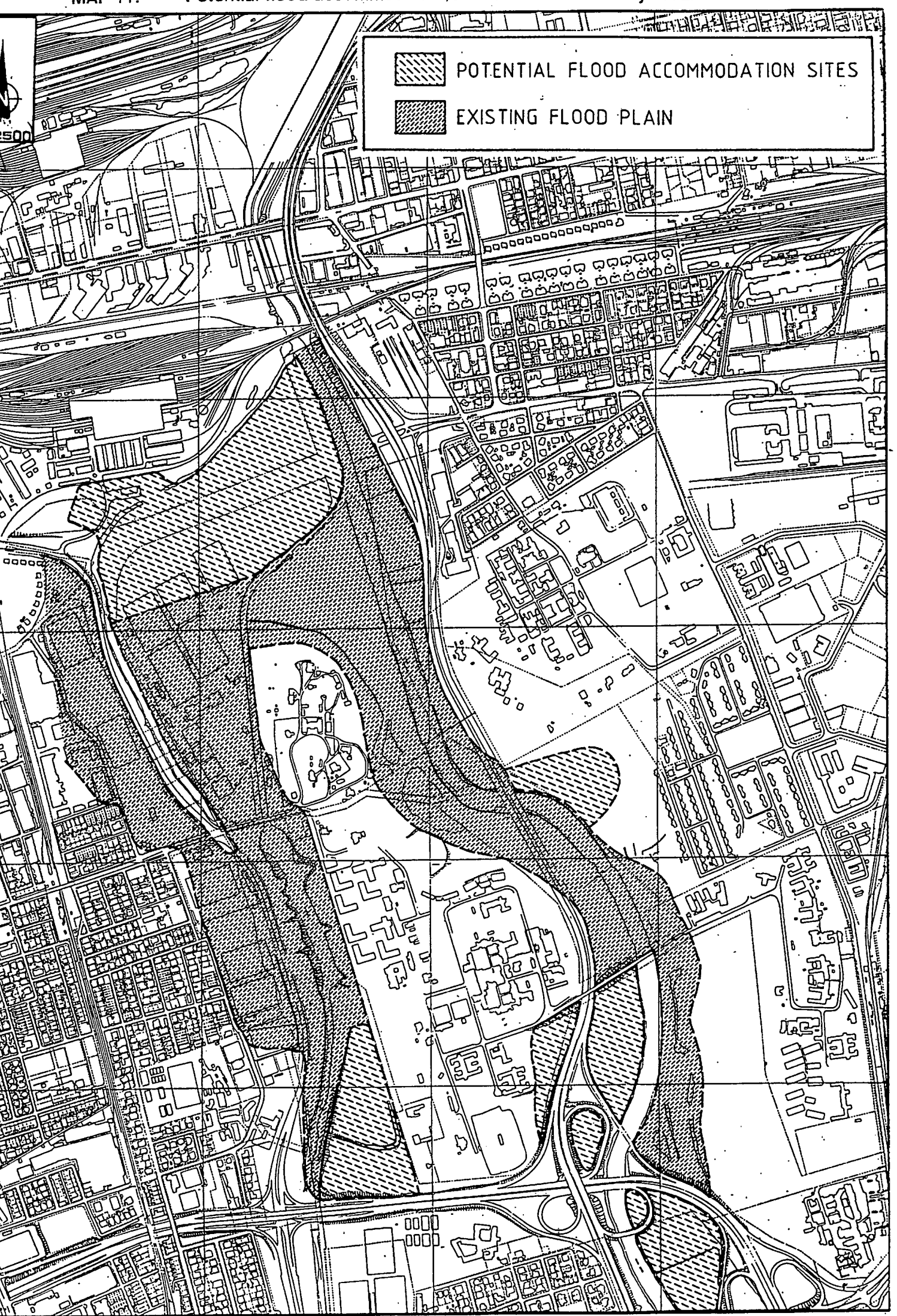
scheme and the expense which such a programme will incur, it might be worth investigating some form of flood control mechanism for this site. For this end, a lake has been suggested (BID, p76), but a number of dams, ponds or channels might also prove effective.

It is argued by the proponents of river widening, that there is no other suitable land in the area where retention or stilling ponds or other flood absorbtion facilities might be located (Lief, 1994), but here is a fine example. In the past, the site was offered to the City Council to make suggestions for a suitable use, but no proposals, other than the Berkeley/Malta road connection, have been forthcoming (Boddington, pers. comm., 1993). Flood control on this site could be an opportune proposal.

In its present condition, this eco-room is valuable from an ornithological point of view, as it is host to grass birds and Raptors which do not live in the wet conditions found in the reserve area. Many species use the site for breeding because of its open and undisturbed character, the many trees and shrubs which abound, and the lack of flood danger.

However, should the site be rehabilitated or used for flood accommodation purposes, additional wetland habitat will be created. It should be remembered that no other wetlands exist besides Paarden Eiland and Rietvlei in the north and the southern wetlands situated on the False Bay coast and this type of habitat needs to be supplemented where possible. It must be emphasised that the river courses, in the study area, act as movement routes and traditional habitats for thousands of birds during the course of the year. Habitat diversity is highly beneficial for species richness and a combination of wetlands, river and dry lands is essential. It is recommended that these three habitat types be maintained.

Bird counts, as referenced in Turpie, were conducted on a fortnightly basis by this author, but do not take account of all the occasional visitors and night birds. The effect of future developments in this area must take cognisance of the needs of these migrants and night birds species. Artificial lighting has been shown to negatively affect


POTENTIAL FLOOD ACCOMMODATION SITES
EXISTING FLOOD PLAIN

bird numbers at Paarden Island (Whitelaw, pers. comm.). It is therefore recommended that these concerns be addressed in any future land use proposals.

It is recommended that the proposal to incorporate the site into the existing bird sanctuary be considered and that the site be managed as a flood control area and or a park. This could incorporate the proposal to develop the site as a recreational lake or as a series of waterways, also incorporating an urban walkway and other passive and active recreational functions. Care must be taken via a comprehensive management plan, to first effectively screen these activities from bird areas and from the roads, using low-cost techniques such as indigenous vegetation, so as to not disturb the fauna and avifauna which use the area extensively.

The siting of the Berkeley\Malta Road connection here is probably ill advised. The disturbance caused by this road connection will be severe. With the availability of the Culembourg goods yards, ample alternative opportunity will exist for the construction and widening of roads there. It is recommended that the site be used as part of a cycle route to encourage the use of alternatives to the motor car.

It is further recommended that the proposals to develop the site for a hotel or as a housing estate not be considered.

5.3 LIESBEEK PARK RECREATION CENTRE AND FIELDS

This recreation centre adjoins the first eco-room to the south. It is bounded by the "old" Liesbeek River in the west, the canalised Liesbeek in the east and Observatory Road in the south. These fields are currently used as a golf driving range. They are waterlogged for approximately six months of the year. During these wet times they serve as a rich feeding ground for several bird species (BID app.5). The club house and adjacent buildings are utilised for social, music and other commercial projects.

PLATE 12: The main building at Liesbeek Park Recreation Centre.

5.3.1 ASSESSMENT FOR LIESBEEK PARK RECREATION CENTRE AND FIELDS

As the highest point on this site is 3.7m above mean sea level, it falls well within the 1:50 year flood plain which is placed at the 4.6m contour while the 1:20 year flood line lies on the 4.0m contour. It is known that these figures are in need of review (BID, p19). The lowest point of the site is 2.7m above mean sea level.

Building restrictions apply to land which falls within a flood plain and the Administrator's permission is required for a departure from this ruling. There would need be strong reasons to justify the altering of the hydrology and flow of water on the site.

As with the previous site, this site lends itself to the accommodation of the floods which threaten the low lying areas along these rivers. Situating sports fields within a flood plain is considered acceptable in planning practice (Hugo & de Villiers, 1988).

PLATE 13: Liesbeek Park Recreation Centre sports fields under flood water.

At this point it is worth noting that the sports fields on the north/western side of the Liesbeek Parkway, north of Hartleyvale, also become water-logged and inundated for a portion of the year.

This site also holds recreational potential as part of a cycle way to the city which could be developed in tandem with the Culemborg redevelopment. Encouraging cycle use would help to reduce congestion on the access routes to the city, reduce pollution levels and help to improve the general fitness of the society. It has been shown that most of the vehicles entering and leaving the city are occupied by only one person. The availability of a safe and clean cycle way might encourage these individuals to consider this alternative form of transport.

5.3.1.1 I&AP's views on the Liesbeek Park Recreation Centre

Three questions arose out of the issues related to this eco-room.

- *"Will it be appropriate to develop the Liesbeek Sports grounds?"*

Only one statement supported this question, five opposed it with the two neutral statements.

- *"Should the area be developed for public use?"*

Two statements supported such a proposal, one stated that it would be expensive to reclaim as a bird sanctuary, which was interpreted to oppose the idea, and the neutral comment stated that the area was leased out for two years, which in effect supports the question.

- *"Should the area be used for flood pools, the re-establishment of wetlands and a bird sanctuary?"*

There were no opposing statements to this question.

Opinions as to the future of the site appear to be divided. Economic returns from the sale of this land are perceived to be an important motivation in considering built environment for this flood-prone site.

Liesbeek Park	Biological	Histo-cultural	Open Space
Sensitivity	H	M	H

Overall sensitivity is **High**
Biological: Terrestrial avifauna, food source
Historical: Main building over 50 years old and occupied
Open Space: Less than 20% built

5.3.2 RECOMMENDATIONS FOR THE LIESBEEK PARK RECREATION CENTRE

It is recommended that no further built environment be permitted on this site. It is further suggested that the site retain its present use while consideration is given to its use as a possible flood accommodation area and/or its incorporation into a larger open space system or into the Raapenberg Bird Sanctuary.

The site should be developed as a public facility with public consultation and remain public property. If the ownership issue remains contentious, a lease agreement can be entered into between Transnet and the City Council to facilitate agreed uses.

The present buildings on the site can be afforded flood protection by surrounding them with earth berms.

5.4 RAAPENBERG BIRD SANCTUARY

Raapenberg Bird Sanctuary stretches from the confluence of the canalised section of the Liesbeek River along the western bank of the Black River to the bridge which connects the two halves of Valkenberg Hospital. For the purpose of convenience, the Vincent Pallotti Wetland will be considered as part of the Bird Sanctuary, as its incorporation has been provisionally agreed to (BID). The whole river length of Raapenberg Bird Sanctuary is to be considered for river widening. As this development affects the whole sanctuary the four sub-sites will be discussed as one (see map 10).

PLATE 14: Aerial view of Raapenberg Bird Sanctuary along the Black River.

5.4.1 ASSESSMENT OF RAAPENBERG BIRD SANCTUARY

Should river widening take place along the course of the river, it will effectively destroy the bird sanctuary (Management Plan).

Because of its uncertain future, the sanctuary has suffered from an unenthusiastic management programme. Few of the recommendations made in the existing Management plan have been carried out.

Turpie (1994) points out that the various plant communities within Raapenberg are kept in equilibrium by the seasonal flooding and drying out of the area. River widening here would be highly detrimental.

It is noteworthy that other valuable avifaunal habitats exist in the study area which are not formally part of the bird sanctuary for example, Valkenberg Wetlands, Hartleyvale Weir and the old course of the Liesbeek.

Raapenberg	Biological	Histo-cultural	Open Space
Sensitivity	H	M	H

Overall Sensitivity is **High**

Biological: Avifaunal species over 100

Historical: Historic natural remnant, possible archaeological site

Open Space: No buildings

5.4.2 RECOMMENDATIONS FOR RAAPENBERG BIRD SANCTUARY

It is recommended that current approaches to flood control such as river widening, channelisation and canalisation be abandoned and that alternatives to this scheme be investigated.

The length of the sanctuary enjoys a highly - visible profile, serious attention needs to be given to its beautification, the control of the Kikuyu grass and the security of visitors to the area. This can be done in keeping with the recommendations made in the various policy documents discussed in ch. 2.

It is further suggested that the Management Plan for the reserve be updated to include the Vincent Pallotti wetland, Valkenberg wetland and any other areas considered suitable for inclusion. The financial allocation for the implementation of the Management Plan recommendations will need to be increased. A "user pays" principle should be investigated where visitors pay a small entrance charge.

The management suggestions made by Turpie (1994) as outlined in chapter 3, should be adhered to and further developments in the area should be subjected to full impact assessments.

The Sanctuary could form a valuable part of an environmental education programme in conjunction with private and authority support.

It is further recommended that a connecting wetland corridor and pedestrian walkway be investigated, to re-link this study area with Paarden Island and the other wetlands to the north. These links should also be investigated for the Black and Elsieskraal Rivers to the south and east of the study area.

5.5 SOUTH AFRICAN ASTRONOMICAL OBSERVATORY (SAAO)

The Observatory is bordered by the Raapenberg Bird Sanctuary in the north and east, Valkenberg Hospital in the south and the canalised section of the Liesbeek in the west.

5.5.1 ASSESSMENT FOR SAAO

This is an attractive site and a visit to the Observatory leaves one with a feeling of awe. It has a long and rich history and enjoys a very attractive setting. As a tourist attraction, it could prove very popular. Presently, visits are by appointment and an amateur astronomical club invites members of the public to a once a week meeting.

Several attractive buildings have been demolished and replaced by out of character face-brick work-shops. Attention needs to be given to the character of any new structures which might be erected on the site to meet expansion needs.

The Observatory site has three low-lying areas which are prone to flooding and which fall within the 50 year flood plain. These are situated on the periphery of the site alongside the Black River and the Liesbeek canal. River widening is expected to cross the eastern boundary of the Observatory at one of these points.

The proposal by Taylor (1990) for a tea-room on the site, is worth investigating as an existing building could easily be converted for this purpose (BID, p83). However, this would require a policy decision, as the institution is a research facility and a constant stream of visitors might prove disruptive.

PLATE 15: Low-lying section of the SAAO.

The dumping of rubble as part of a reclamation scheme to raise these low-lying areas above the 1:50 year flood contour, should be discouraged. This will exacerbate the general flooding problem.

5.5.1.1 I&AP's views on the SAAO

Two questions arose out of the fact that the SAAO occupies a large part of the confluence area.

- *"Should the SAAO be relocated?"*

Three statements supported this idea, two opposed it with one neutral comment.

- *"Should public access to the SAAO be improved?"*

Four statements supported this use with one neutral statement suggesting a science park/exploratorium for the site. This suggestion can be construed to enjoy widespread approval.

South African Astronomical Observatory	Biological	Histo-cultural	Open Space
Sensitivity	M	H	M

Overall sensitivity is **Medium**

Biological: terrestrial and wetland avifauna, low disturbance

Historical: Buildings over 100 years old and occupied

Open Space: 20% built form

5.5.2 RECOMMENDATIONS FOR THE SAAO

It is recommended that the possibility of using the site as a tea-room, science park or science museum and tourist attraction be investigated with the owners. In addition, no further demolition should be allowed on the site, and any further expansion needs should be accommodated at the Sutherland Observatory.

It is recommended that alien eradication which has begun on site, be completed and that a re-planting program, using indigenous plants, useful to the birds in the sanctuary, be implemented.

It is further suggested that the low-lying areas which fall within the 1:50 year flood plain and which are subject to annual flooding, be incorporated into the Raapenberg Bird sanctuary and be managed as part of a holistic flood control scheme.

5.6 VALKENBERG HOSPITAL - EAST & WEST & GATEWAY PARK

For the purpose of clarity, the Hospital will be dealt with in two halves. The western campus stretches from its boundary along the Liesbeek River to its eastern boundary which runs along the course of the Black River. The northern boundary is the SAAO while the southern boundary is the N2 (see Valkenberg A on map 10).

The eastern campus is bounded in the east by Alexandra Road, in the north by Maitland Garden Village, in the west by the Black River and in the south by the Vincent Pallotti Hospital (see Valkenberg B on map 10).

Besides the expected renovation and expansion needs of the hospital, the sale of hospital land and the nature of its possible development is one of the main issue for this site.

The two halves of the hospital cover a large area, and this fact, in conjunction with the other large institutions within the study area, has had a determining influence on the character of the area.

The two halves of the Hospital are quite different in terms of their current functioning.

The Western Campus (5A)is the larger and is at present the more utilized and contains most of the Hospitals infrastructure. The site has its entrance in the West via Observatory Road. This section houses the Main Administration Complex, which is a declared National Monument, and several other buildings of historical note. It also houses most of the clinical facilities and is the area wherein UCT are developing their "Courtyard" project. A number of terrestrial bird species use the site, amongst which are to be found the Red-breasted Sparrowhawk, the migrant Steppe Buzzards, and Eagle Owls.

The Eastern Campus (5B) is connected to the previously discussed section by two bridges which cross over Black River Parkway and the Black River itself. Access is also possible via Alexandra Road in the east. This campus of the Hospital is currently mostly empty and is being subjected to vandalisation and theft. The future of this section of the hospital is unclear and there appears to be no will to save what is there as no security personnel patrol the area. Most of the buildings in the southern section of the site adjacent to the "Gateway Park" project are stripped and derelict.

This section of the Hospital houses the maximum security facility and a number of "open" wards where patients are under their own recognisance. "Die Oude Molen" has recently been identified on the site (personal observation) and confirmed by the City Council and National Monuments Council (Attwell and Hart). This building is now vacant and being subjected to theft and vandalism. A motivation for declaration as a National Monument is currently being processed, whereupon the building and site will be "flagged", which means that it is identified as a potential monument.

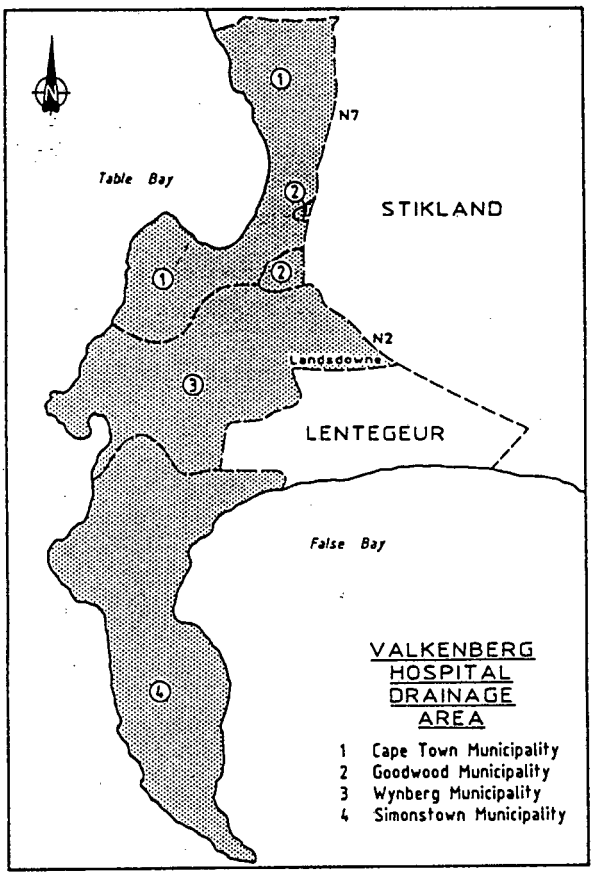
5.6.1 ASSESSMENT FOR VALKENBERG HOSPITAL

Most of the patients at Valkenberg and The Alexandra Care and Rehabilitation Centre are accommodated indoors and under supervision. The potential danger to visitors is therefore more perceived than real. Dangerous psychotic patients are under guard in incarceration. Those who are allowed out on their own recognisance are of a less severe nature and therefore present little threat to visitors. It is acknowledged that the hospitals administration needs upgrading but this will not happen in a climate of uncertainty over its future.

There are three large psychiatric hospitals in the greater Cape Town Metropolitan area. They are Valkenberg, Lentegeur and Stikland. A map, showing where they derive their patients, follows.

If the hospital is finding funding difficult, it should consider letting some of its less used buildings and sports facilities for appropriate uses.

MAP 12: Drainage map for Valkenberg Hospital.



As regards this last point, efforts have been made in other parts of the world to do away with these large mental hospitals by having the patients housed in smaller homes within the suburbs. These attempts have proved largely unsuccessful (Whitelaw, pers. comm.), with the patients tending to congregate around shopping centres and displaying abnormal behaviour.

5.6.1.1 I&AP's views on Valkenberg Hospital

In view of the fact that Valkenberg Hospital occupies a large percentage of the study area, two issues were raised.

- *"Should Valkenberg Hospital be relocated?"*

There were conflicting ideas on this point. Five statements supported this idea, three opposed it and six statements were construed as neutral. Less conservative

interpretation of the neutral statements indicates that they actually opposed the idea of relocation.

- *"Should the patients at Valkenberg Hospital be more integrated with the local community?"*

Most statements indicated that psychiatric patients could benefit from more integration with local residents.

WESTERN CAMPUS

Valkenberg West	Biological	Histo-cultural	Open Space
Sensitivity	H	H	H

Overall sensitivity is **High**

Biological: Terrestrial avifauna, tall trees, rodents

Historical: Buildings over 100 years, occupied, archaeological sites

Open Space: Institutional open space, less than 20% built form

EASTERN CAMPUS

Valkenberg East	Biological	Histo-cultural	Open Space
Sensitivity	L	H	M

Overall sensitivity is **Medium**

Biological: Disturbed land

Historical: Buildings over 100 and 50 years old

Open Space: Less than 75% built form

5.6.2 RECOMMENDATIONS FOR VALKENBERG HOSPITAL

Rather than moving the patients to the suburbs or relocating this facility, it is suggested that this large institution be opened to the public as a centre for relaxation and recreation, thereby creating an environmentally therapeutic area for the larger community of Cape Town.

It is recommended that a Policy Plan be drawn up for the area reflecting this vision. This should contain clauses that will ensure the continued tranquillity, well-being and security of the residents on the site of Valkenberg Hospital as a whole.

Besides the rights of psychiatric patients, it is recommended that any redevelopment pressures be exercised in consideration to the area as a whole. It is therefore recommended that the Gateway Park site, which has not yet begun, be re-evaluated and a use more conducive to the medical character of the area be investigated, in keeping with its elevated and highly visible profile within an open space system.

For this reason, it is incumbent on the planning authorities to develop a Policy Plan for the area which will be binding. If the current zoning system is considered inadequate in this regard, then a new scheme should be investigated. Perhaps the protection provided by declaring the area a Limited Development Area (LDA), as per the Environmental Conservation Act 73 of 1989, might be considered appropriate as an alternative.

As has been pointed out in chapter 3, the hospital grounds offer an extensive habitat for terrestrial birds. Species which require large habitats such as owls and other birds of prey, as well as shy birds, Herons and Buzzards etc, are to be found in the grasslands and tree groves.

It is therefore recommended that the area be conserved in keeping with the habitat requirement of the avifaunal diversity to be found there.

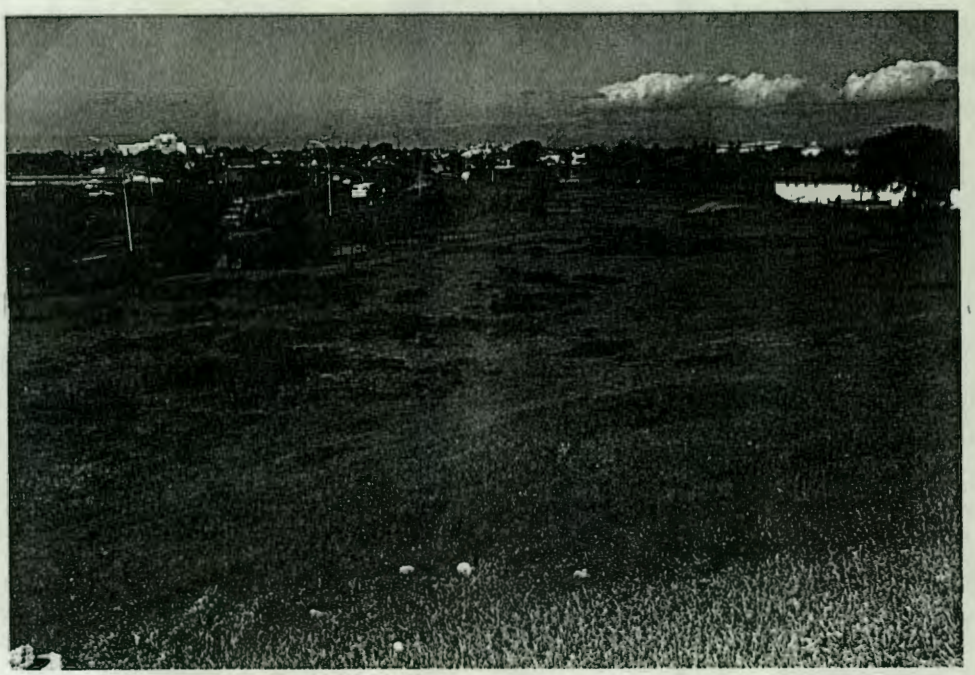
Due to the large area covered by the hospital, consideration should be given to its use as part of a larger green lung in order to minimise the negative effects of air pollution while complimenting the principles of Perma-culture. These principles involve a concept of permanent agriculture and an "edible environment", the idea being, to use vegetation in as diverse manner as is possible, and not just for ornamental reasons.

In order to achieve the above goals, the site should be regarded as part of the open space system requirements for the densifying city and be opened to the public through forming part of a greater system of walkways, jogging and cycle routes.

The historical value of the area has been outlined in Chapter 5 of the BID (p 57), and as such, it is recommended by several policy documents as an area worthy of conservation and appropriate for recreational purposes. The architectural integrity of the area is noteworthy, which will attract tourists.

An appropriate mixed land use, involving only existing buildings is recommended for the site. Not before existing buildings are fully utilized should additional structures be considered.

PLATE 16: Low lying S/E corner of Valkenberg West.



The lower lying south-eastern area of the hospital which is prone to flooding and waterlogging should be developed into a low-cost water feature serving an holistic flood, water quality, and conservation function.

5.7 NORTH-EAST BLACK RIVER

The boundaries of this site are the Black River in the west, the Black River Parkway where it crosses the Black River in the south, Black River Parkway in the east and the railways bridge where it crosses the Black river in the north.

5.7.1 ASSESSMENT OF NORTH-EAST BLACK RIVER

This site has been proposed as an alternative to the present one for the widening of the Black River. Rather than widening along its western bank and into the Bird sanctuary, this would utilise the east bank (Management Plan). A difficulty with this proposal is the proximity of Black River Parkway, and electricity cables which run parallel to the Black River here.

Bridges and service facilities will have to be extended or re-located, at considerable expense, if river widening takes place here. Widening on this site might then, still prove cost effective, if the environmental costs of the alternative, habitat destruction, is taken into proper account.

This site would also be affected were the Berkely/Malta Road connection to take place. Much of the site falls within the 1:50 year flood plain and fill or construction here would result in further loss of floodplain.

N-E Black River	Biological	Histo-cultural	Open Space
Sensitivity	M	L	H

Overall sensitivity is **Medium**

Biological: Roosting site for avifauna

Historical: Possible meridian beacon

Open Space: No built form

5.7.2 RECOMMENDATIONS FOR NORTH-EAST BLACK RIVER

It is recommended that the site be used as part of a holistic approach to flood alleviation. In the interim, it is recommended that it be used as a site for the positioning of "Waste-away" type containers, which will hopefully alleviate the problems of illegal dumping in the river course.

Earth berms should be constructed along the length of the Black River Parkway to attenuate noise and air pollution, using dredged material from the rivers, in accordance with the recommendations made in the Greening Report. These should be vegetated to meet identified needs with either bird attracting, wind resistant or medicinal and/or plants with commercial value.

5.8 MAITLAND RESIDENTIAL AND COMMERCIAL AREA

This site comprises mixed residential, light industrial and commercial uses and lies in the north eastern part of the study site. This node is somewhat cut-off from the larger area, unless Alexandra C&RC can be opened to pedestrian and cyclist movement.

5.8.1 ASSESSMENT OF MAITLAND RESIDENTIAL & COMMERCIAL AREA

The City Abattoirs immediately across the road is currently in contention for sale and or redevelopment. This offers additional scope for alternative sites for any development other than recreational, within the study area.

Maitland Residential	Biological	Histo-cultural	Open Space
Sensitivity	L	M	L

Overall sensitivity is **Low**

Biological: No importance

Historical: Some buildings over 50 years old

Open Space: More than 75% built form

5.8.2 RECOMMENDATIONS FOR MAITLAND RESIDENTIAL & COMMERCIAL AREA

It is recommended that pedestrian access be provided from this area to the open spaces offered by the rest of the study area. This could be achieved via Alexandra Care and Rehabilitation Centre.

5.9 ALEXANDRA CARE & REHABILITATION CENTRE (AC&RC)

The Alexandra C&RC is bounded by Alexandra Road in the east, the Maitland residential area in the north, Black River Parkway in the west and Maitland Garden Village in the south.

As with Valkenberg Hospital, it is the possible sale of land, or the relocation of the services provided by the Centre, which will have the most impact on the open space potential of the study area.

5.9.1 ASSESSMENT OF AC&RC

This centre is embarking on an extensive re-development program which will involve the demolition of most of the existing buildings and their replacement with single storey modern, face-brick structures, not in keeping with the "grand" architecture of the existing two and three-storey buildings.

As the existing buildings are demolished, levelling and infill, using the rubble, is occurring in the low-lying south-western corner of the property, thus altering the contour and open space aspect offered by the site.

The site is endowed with a sense of history and has a declared National Monument, in the form of an old mill, situated on its premises. This re-development program will result in a changed character for the site. More appropriate architecture could have been employed when designing the new buildings to retain a sense of history. Alternatively, renovated ablution facilities and carefully considered improvements to the existing buildings could have resulted in achieving the same ends. No amount of physical change will improve the notoriously poor conditions at the hospital. These are rather as a consequence of poor staffing and service conditions.

In the past, the Centre has experienced problems with security from the surrounding housing and industrial developments. This situation could be exacerbated were inappropriate developments to take place on its perimeter. Many parents have placed their retarded off-spring here under the impression that it was "for life". It is thus incumbent on the authorities to ensure the continued existence of this Centre in a condition appropriate to meet these needs.

The main administrative building is to be retained as a representative of the Centres former character, at the discretion of the National Monuments Council.

5.9.1.1 I&AP's views on AC&RC

Two issues emerged from the PCP.

- *"Should Alexandra Hospital use the surrounding areas for its patients?"*

Two statements supported this question with one neutral comment.

The author was employed by the parents of a group of autistic adolescents and young adults for five years at this facility and can personally attest that the residents would benefit from outings and walks in the open spaces of the study area.

A training programme, focusing on the staff of the hospital would be the only way in which the goal of outdoor therapy could be achieved.

- *"Should Alexandra Hospital be relocated?"*

One comment supported this statement, two opposed it, with four comments being interpreted as neutral but which in fact reject the statement.

It would appear that there would not be much support for the idea of relocating the hospital. Most landowners in the study area tend to oppose relocation.

Alexandra C&RC	Biological	Histo-cultural	Open Space
Sensitivity	L	M	M

Overall sensitivity is **Medium**
Biological: Few terrestrial avifauna
Historical: Buildings older than 50 years
Open Space: Less than 75% built form

5.9.2 RECOMMENDATIONS FOR AC&RC

It is recommended that this site form part of the Policy Plan for the area which will safeguard its historic character, and that it remain a tranquil and secure place for the continued well-being of its residents.

As with the Valkenberg Hospital it is recommended that appropriate mixed use of existing buildings be considered, if this becomes necessary to raise funds. Currently the facility is over subscribed.

A pedestrian through-route, from the residential area of Maitland, through the AC&RC to Maitland Garden Village and the Golf Driving Range to the natural open spaces of the study area, for cyclists and joggers should be investigated.

5.10 MAITLAND GARDEN VILLAGE (MGV) AND GOLF DRIVING RANGE (GDR)

Alexandra Road forms the eastern boundary of this site, Valkenberg Hospital, the southern boundary, Black River Parkway the western boundary and Alexandra Care and Rehabilitation Centre, the northern border.

This City Council owned land is currently being sold to the tenants while the westerly portion of the site is let to Rotary and used as a golf driving range. The low-lying section of this land parcel once fell within the 1:50-year flood plain, but recent infill has raised it by a metre or two.

PLATE 17: View of Maitland Garden Village and golf driving range.

The remaining low-lying land between the driving range and the Black River supports an assortment of grass birds and small mammals. This area remains green for most of the year, indicating a high water table. This portion is currently ear-marked for river widening.

5.10.1 ASSESSMENTS OF MGV & GDR

It has been suggested by Taylor (1990), that the Maitland Garden Village be extended onto the driving range. This area could be used to house sports fields and other recreational facilities, which are currently lacking for the residents of this eco-room, thereby retaining open space and facilitating occasional inundation by flood waters.

5.10.1.1 I&AP's views on MGV & GDR

It was agreed that there is a need for development in Maitland Garden Village to help upgrade the area. It was also agreed that there is a need for improved work opportunities in the area. This could be achieved in the Commercial and Industrial area of nearby Maitland and Ndebeni.

Maitland Garden Village	Biological	Hist-cultural	Open Space
Sensitivity	M	M	H

Overall sensitivity is **Medium**
Biological: Terrestrial avifauna, grass birds, food source
Historical: Buildings over 50 years and occupied
Open Space: Less than 20% built form

5.10.2 RECOMMENDATIONS FOR MGV & GDR

It is recommended that the site, including the golf driving range, be investigated as a possible site for the fulfilment of the identified needs of the inhabitants of Maitland Garden Village and that this function be integrated with the use of the site as a part of the holistic approach to flood alleviation for the area.

It is recommended that the golf driving range site also be used as part of an urban walkway, jogging and cycling track and managed as part of the Raapenberg Bird Sanctuary.

5.11 VINCENT PALLOTTI FIELD

This field is currently vacant and is zoned as public open space. There are currently no proposals for the site. It is bounded in the west by the Pallotti wetlands, in the east by Valkenberg East, in the south by Vincent Pallotti Hospital and in the north by the road which connects the two halves of Valkenberg Hospital.

The site currently accommodates several species of avifauna, especially Raptors. There is also a large colony of Dune Moles here.

5.11.1 ASSESSMENT OF THE VINCENT PALLOTTI FIELD

The potential for building here is limited as the slope is acute and the soil is very sandy consisting of alluvium deposits which restrict construction due to the compaction potential, low bearing capacity and the depth of the soil. The construction of multiple storey buildings on this site would be difficult and costly.

Pallotti Field	Biological	Hist-cultural	Open Space
Sensitivity	H	L	H

Overall sensitivity is **High**
Biological: Avifaunal species over 40
Historical: No known relevance
Open Space: No built form

5.11.2 RECOMMENDATIONS FOR THE VINCENT PALLOTTI FIELD

Turpie (1994) suggests that the site is suitable for rehabilitation and that "the reintroduction of some fynbos plants such as Protea repens, which would attract additional terrestrial bird species to the area". This recommendation is supported.

In addition, it is recommended that the site be incorporated into the Raapenberg Bird Sanctuary and managed as a terrestrial habitat in that Sanctuary and for recreational purposes. This should only take place once suitable vegetative screening has been established to minimise bird disturbance.

5.12 VINCENT PALLOTTI HOSPITAL

This hospital was built in 1938 and is run as a private hospital. It is bounded by Gateway Park in the north, Alexandra Road in the east and the N2 in the south and west.

5.12.1 ASSESSMENT OF THE VINCENT PALLOTTI HOSPITAL

The hospital is well used but has no expansion needs. No consideration should be given to relocating it.

Pallotti Hospital.	Biological	Histo-cultural	Open Space
Sensitivity	L	M	M

Overall sensitivity is **Medium**
Biological: Few avifaunal species
Historical: Buildings over 50 years old and occupied
Open Space: Less than 75% built form

5.12.2 RECOMMENDATIONS FOR VINCENT PALLOTTI HOSPITAL

It is recommended that it retains its current use. Attention can be given to the construction of vegetated berms along its borders which abut the roads. The vacant ground below and to the west of the hospital should be kept as a formal garden for the recreation of the patients or to some other low-impact use which is not noise sensitive.

5.13 UNIVERSITY OF CAPE TOWN HOLDINGS

5.13.1 BRIEF DESCRIPTION OF UCT'S HOLDINGS

This eco-room is situated within the south-western section of Valkenberg Hospital. It is bounded in the south by the N2, in the west by Valkenberg wetland, in the north by the Occupational Therapy unit of the hospital and in the east by an internal hospital road.

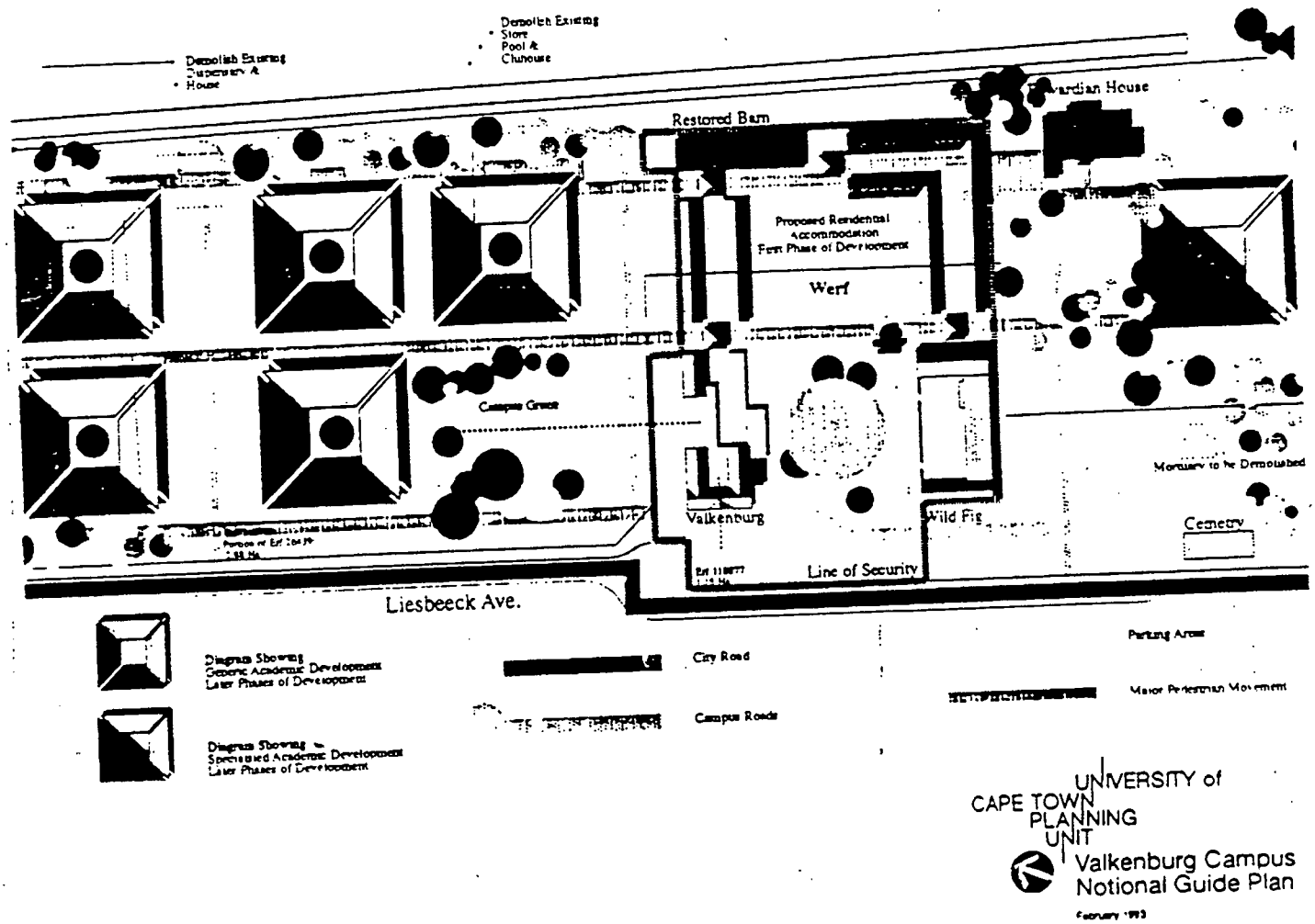
The site has three types of ownership, the "Courtyard" development, a large vacant grassed field to the north which is owned by UCT, and a further grassed field which is leased by them and for which they are negotiating to purchase from the Department of Community Development, with a view to establishing some form of University facility.

PLATE 18: Open field north of Courtyard development.

5.13.1 ASSESSMENT OF UCT's HOLDINGS

The Courtyard development surrounds the Historical Monument of Valkenberg Homestead and it is intended to serve as executive holiday accommodation. It consists of 70 double-storey town house units, which after 20 years, are intended to serve as University residences.

FIGURE 4: UCT's proposed Valkenberg Campus.
From UCT application to CCC 1993.



The development was intended to "restore the integrity" of the site by re-connecting the Homestead with its surrounding out-buildings, which had previously fallen under

different ownership to that of the main house. This has not occurred, the "Ou Werf" at the back of the building is now more lost than before being overshadowed by double storey townhouses right against its western wall.

The development is of a high density and further expansion is to take place affecting the existing buildings around it. Mr. Owen Kinahan of the Historical Society comments that "They couldn't fit another brick on the site if they tried!" (pers. comm.)

The buildings are currently at roof level.

As to UCT's intention to develop a campus on the greater site, the outcome of these Masters dissertations will undoubtedly be used as an attempt to sanction their developmental intentions despite the clause prohibiting this in the BID (p9). This is why the TOR called for a "land use" exercise and not a "conservation or impact assessment" exercise.

Were the development to remain as a holiday type establishment, further negative impacts will be avoided, but if more residences are to be erected, the character of the greater area will be changed.

It must be noted that the fields to the north of the Courtyard development support a large diversity of terrestrial birds.

5.13.1.1 I&AP's views of the Courtyard development

- The overarching statement was that "there are concerns about the UCT Courtyard Development" (BID, app.17, table 8). These I&AP comments were accommodated under four questions.

- *"Was planning for the Courtyard development done in appropriate manner?"*

Seven opposing statements were received indicating unanimous consensus that planning was not adequately undertaken.

- *"Will the Courtyard development have a negative impact on the confluence area?"*

Eight comments can be construed as indicating that the development will have a negative effect on the area, while four thought that it would have positive impacts but only of an economic nature.

- *"Are there concerns about the motives for the Courtyard development?"*

There was general consensus that there were concerns about the motives for this development.

- *"Should the UCT development be allowed to continue?"*

Eight comments can be construed to indicate that the developments should not be allowed to proceed with three indicating that it should.

From the above it can be assumed that there is a great deal of opposition to the development. This would indicate that any future developments on the site will meet with equal opposition unless the I&AP's can be convinced that the developments are in the communities interests.

The open fields to the north of the current development are home to several bird species including the migratory Steppe Buzzard, Red-Breasted Sparrowhawk, Eagle Owls, Black-Headed Heron, Black-Shouldered Kite and Cape Francolins amongst other species. It is one of the few remaining open fields in Cape Town which does not have a formal recreational role and is therefore highly undisturbed by human presence.

UCT AREA	Biological	Histo-cultural	Open Space
Sensitivity	H	H	H

Overall sensitivity is **High**

Biological: avifauna over 40 species, food, habitat

Historical: archaeological sites, historic buildings

Open Space: less than 20% buildings

5.13.2 RECOMMENDATIONS FOR UCT's HOLDINGS

The current development should have a environmental management plan drawn up to ensure that the sensitivity of the site is protected. Several requirement have been contravened, including the trapping of birds in the adjacent wetlands by the construction workers.

UCT should adopt the IEM procedure when dealing with all future expansion and developments. A needs and desirability exercise might assist in proving the worthiness of their future needs.

No more development should take place in the area acquired by UCT and they should consider ceding the area to the Cape Town City authorities as part of the coast to coast greenway and open space system.

5.14 VALKENBERG WETLAND

Historical aerial photographs show that this wetland is artificially created and was once farmland. It is bounded in the south by the N2, in the east by Valkenberg Hospital, in the north by Liesbeek weir and in the west by Liesbeek Parkway.

A 1934 aerial photograph indicates that the course of the Liesbeek River has been altered. It once flowed where the current Liesbeek Parkway is and a section of the

original course still remains from the traffic intersection at Observatory Road to its confluence with the Black River (see plate 6).

5.14.1 ASSESSMENT OF THE VALKENBERG WETLAND

Hart and Hall (1990) have pointed out that the remains of an old mill lie at the eastern edge of the wetland and that these are of archaeological significance.

The current wetland was once more extensive, having now been bi-sected by a berm so that the southern section could be drained and made into a picnic site. This picnic area has not proved very successful as it is waterlogged and partially inundated in winter and also because it is right next to and is overlooked by the N2 highway which makes it very noisy, smelly and exposed to the passing motorists. The picnic site is also often adversely affected by a mains sewer which overflows in times of heavy rain, spilling raw sewerage into the area (Lief, 1993).

The bird life on the site is varied (Turpie, 1994). The vegetation is mostly reed and bulrush, Kikuyu and alien invaders. There is a grove of invasive Poplar trees at the eastern end of the picnic site which are beginning to spread to the wetland section.

The site is currently used mostly by joggers and as an exercise area for people walking their dogs. Vagrants utilize the more densely vegetated areas.

The site serves a useful function as a flood plain and the picnic area acts as a drainage basin for the St Georges Grammar School sports fields on the southern side of the N2. A drainage pipe passes under the N2 to connect the two sites.

Valkenberg Wetlands	Biological	Histo-cultural	Open Space
Sensitivity	H	H	H

Overall sensitivity is **High**

PLATES 19 & 20: **Valkenberg picnic site, dry and wet.**

Biological: avifaunal breeding site, wetlands, over 40 species.
Historical: archaeological site of old mill
Open Space: no buildings

5.14.2 RECOMMENDATIONS REGARDING THE VALKENBERG WETLANDS

The site needs more active management to remove alien growth, to control the growth and spread of the reeds, and to ensure an adequate water level throughout the year in accordance with specialist input. The last mentioned point can be achieved by the occasional pumping of water from the Liesbeek River into the wetland. The Kikuyu grass is sometimes so long and thick that access is reserved for those people who are able to contend with it.

The Greening of The City Report recommends the creation of parkland, hides and interpretive centres linked to a nature trail and an island refuge for birds and notes that the site should become a bird and aquatic fauna protection area with viewing hides (BID, p 98). This recommendation is supported.

In view of the lack of success enjoyed by the picnic site, and the storm water problems facing the city as well as the conservation problems caused by habitat destruction, it might prove sensible to re-convert the site to wetland, retaining part of the berm as an island for bird refuge. This could be achieved as a school project and fulfil a community involvement need. The recreation of a wetland here would also prevent the raw sewerage which spills, from being flushed directly into the Liesbeek and subsequently into Table Bay.

Replacing exotic trees with indigenous and "bird friendly" trees would also enhance the area as a conservation site. Consideration should be given to the inclusion of this site and the following one, into the Raapenberg Bird sanctuary so that management principles can be applied on a more holistic basis.

5.15 HARTLEYVALE WEIR

This is situated in the west of the study area and is bounded in the north by Observatory Road, in the west by Liesbeek Parkway, in the south it is bounded by the previous eco-room while the east is bounded by Valkenberg Hospital.

This weir was created to serve as a pumping dam for the supply of water to the SAAO. It has become a popular site for people to sit in their cars, walk their dogs, cycle, jog and fish, and is a particularly favoured site for the gathering of gulls and feral pigeons and the threatened White Pelican (Turpie, 1994).

PLATE 21: Hartleyvale weir under flood.

The site is very exposed to the S.E. winds and the lake is often very polluted with wind blown waste from the nearby road and from the bins placed there. These are used by visitors to the area and by the large crowds who visit the Hartleyvale sports facilities. The lake also tends to silt up and become matted with water plants such as Parrots Feather, especially during the summer months.

5.15.1 ASSESSMENT OF HARTLEYVALE WEIR

Although polluted, the lake serves as a valuable recreational area for local residents and for road users. It is also rich in bird life and, as mentioned, is particularly favoured by Hartlaubs and Kelp Gulls which gather here in their hundreds and sometimes thousands (Steele, Promerops Nov. 91 No 201). The reason for their favouring this area appears to be multi-faceted (Steele, pers comm). It is a place for them to bathe in fresh water, it is open and allows for wide visibility, people tend to feed them and it appears to be a place where upward air currents aid the gulls to attain heights which then allow them to continue their journey to their northern or southern habitats.

PLATE 22: Gulls over Hartleyvale weir. Note the mowed lawns.

The Greening Report favours the area as a "water related linear park" with a nature walkway and related facilities as with the Valkenberg wetland. It sees this as a high priority need and the estimated cost in 1982 was R60,000. It also envisages tree and shrub planting, but this must be done sensitively so as not to alter the environmental

factors which make this a suitable habitat for the Gulls, as discussed. These recommendations have not been implemented.

Hartleyvale Weir	Biological	Histo-cultural	Open Space
Sensitivity	H	L	H

Overall sensitivity is **High**
Biological: Over 40 species of avifauna, fish
Historical: No features
Open Space: No buildings

5.15.2 RECOMMENDATIONS FOR HARTLEYVALE WEIR

The size of the weir could quite easily be enlarged, thereby cutting down on the cost of mowing the extensive Kikuyu lawns on the east and west banks. In addition, an island could be created in the lake for conservation and aesthetic reasons.

Any motivation for development here should be carefully considered so that it does not diminish the recreational nature of the open space.

Dredged material removed from the lake should be used to create a berm between the Liesbeek Parkway and the lake to attenuate the noise pollution. Care must be taken when doing this to not interfere with the thermal dynamics used by the Gulls.

It is further suggested that the lake be reconnected with the old course of the Liesbeek River and that the canalised section through the SAAO be retained as a back-up for flood conditions.

Consideration should be given to the incorporation of this eco-room into the Raapenberg Bird Sanctuary and managed as such.

5.16 THE OLD COURSE OF THE LIESBEEK RIVER

This stretches from Observatory Road in the south, along the Liesbeek Parkway in the west, to the Railways workshops in the north and it is bounded on the eastern side by Liesbeek Park Recreation Centre.

This part of the Liesbeek River is very attractive and has a great deal of potential for the development of an urban trail and recreational area.

5.16.1 ASSESSMENT OF THE OLD LIESBEEK

The southern end is currently overgrown with large Poplar trees and other exotic vegetation, although, this is interspersed with some indigenous growth. This problem of exotic vegetation needs attention as the river course spreads these alien seeds. When clear of clogging water hyacinth and parrots feather, it is rich in bird life, despite its very stagnant condition. This situation has recently been improved with the unblocking of a connecting pipe which runs from the Hartleyvale Lake, under Observatory Road and into the blind end of this stretch of the river, but the diameter of the pipe is insufficient to flush the system. This was achieved through the motivation of the Conservation Committee of the Cape Bird Club and their involvement is an example of what can be achieved through community participation in the management of the area.

Three kingfisher species, two of which nest here, and the rare Purple Heron use this stretch of the river almost exclusively. This is probably due to the fact that this stretch of the river is used as a breeding area by carp and other fish species found in these water courses.

Road widening of the Liesbeek Parkway is expected to require that this whole section of the Liesbeek be filled and storm water be channelled in underground pipes (Lief, 1994, BID, p 55). This would undoubtedly impact negatively on the river and this development needs to be subjected to a full impact assessment.

Any development of the Liesbeek Park Recreation Centre, which is bordered by this part of the river, would also impact on the river.

Old Liesbeek	Biological	Histo-cultural	Open Space
Sensitivity	H	H	H

Overall sensitivity is **High**
Biological: Kingfisher breeding, fish breeding
Historical: Original boundary of Cape Colony
Open Space: No buildings

5.16.2 RECOMMENDATIONS FOR THE OLD LIESBEEK

This section of the river should be reconnected with the main flow of the river so as to improve the movement of water within it. Other impediments to the flow of the water should be removed.

It is recommended that the course of the old Liesbeek River be incorporated into the Raapenberg Bird sanctuary and managed as part of this reserve, with the development of recreational facilities, sympathetic with its conservation status and in keeping with the fact that it lies within a designated flood plain. Ways which will improve the sanctuary's budgetary requirements should be investigated.

The north-eastern bank of this section of the river, supports a wetland area. This lies near the railway bridge across the Black River, and supports a number of birds and its banks are a favoured nesting area for the Black Shouldered Kite. Greater attention should be given to the management of these wetlands to control reed and silt encroachment and build up.

5.17 NEW AND WIDENED ROADS FOR THE STUDY AREA

All the roads which surround the study area are expected to require upgrading or widening in the future and road reserves exist along the course of the Black River Parkway and along Liesbeek Parkway. A 1949 proposal for a new road link across the northern end of the study area exists, but its need is being re-examined by the C-BR study.

5.17.1 ASSESSMENTS OF NEW & WIDENED ROADS

The study site is already severely impacted by the roads which surround it and any more developments to the road system will compound these impacts.

The C-BR study has identified the need to reduce the emphasis on private transport in favour of public forms of transport and on the use of cycles (BID, p 49; C-BR, Stage B, app.A p 8). The development of new roads and any road widening will run contrary to these findings.

The study area is currently much blessed by the paucity of through roads. This allows for a wonderful opportunity for a recreational area where people and cars will not conflict.

The Northern section of the study area is at present the quietest and least impacted by surrounding roadways and this feature needs to be capitalised, rather than whittled away with new road schemes.

5.17.1.1 I&AP's views on the use of the study area for transportation

Most comments opposed the question as to whether "the confluence area should be used to address the traffic and transportation needs of Cape Town?" Two statements supported this use, four opposed it while most of the fourteen neutral statements

MAP 13: Open Space proposal for the study area.

indicated that the area would be negatively affected by such development (see BID app. 17, table 23).

5.17.2 RECOMMENDATIONS REGARDING TRANSPORTATION

It is therefore concluded that if the recommendations of this dissertation are accepted and the study area is to be considered as an mixed use open space, that no further encroachment of roads take place, and that alternatives in the form of pedestrian movement be investigated.

It is also recommended that all existing roads be lined with vegetated earth berms as described earlier.

5.18 RIVER WIDENING

River widening, channelisation, canalisation and infill are envisaged for different sections of the two rivers which run through the study area. This approach is also true for several other water courses in the Peninsula.

5.18.1 ASSESSMENT OF RIVER MANIPULATION

River widening and other flood control and attenuation steps could have a significant effect on the whole flood plain and its avifaunal composition.

The Screening Procedures for I.E.M. (1992) lists the development of permanent flood-control schemes as a "listed activity" which would require an impact assessment.

As a "listed environment", municipal nature reserves, streams and rivers, demarcated flood plains and wetlands, biotic assemblages and communities, bird migration sites, aquifers and aquifer-recharge areas, areas with a high natural water table, damaged

land and State land should all be subjected to full impact assessments before any developments are considered..

PLATE 23: Potential flood accommodation site within clover leaf of road system near N2.

5.18.2 RECOMMENDATIONS REGARDING RIVER MANIPULATION

It is recommended that the river widening proposal be subjected to the procedure of Integrated Environmental Management so that alternatives in the form of extended and rehabilitated wetland, retention ponds, stilling ponds or innovative building regulations or some other form of environmentally sensitive option be considered. Consideration should also be given to dealing with the problem at source.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS FOR THE STUDY AREA

6.1 INTRODUCTION

Based on the biophysical, sociocultural and open space characteristics of the study area and the applicable land use policies and plans, fifteen eco-rooms were identified. Ratings for the biological sensitivity, historical and cultural sensitivity, and the open space characteristics, were identified for each of the eco-rooms. Based on the conclusions and recommendations of the eco-rooms, overall conclusions and recommendations are made for the whole study area.

6.2 CONCLUSIONS AND RECOMMENDATIONS FOR THE FIFTEEN ECO-ROOMS

The table below, summarizes the overall sensitivity ratings for the fifteen identified eco-rooms as well as their overall conclusions and recommendations.

TABLE 5: Overall Sensitivity Ratings for the 15 Eco-rooms.

Name	Sensitivity Overall	Overall	
		Assessment	Recommendations
Varschvlei	H	• Questionable landfill • Alien vegetation • Flood control • terrestrial bird habitat • major open space	• Incorporate into Bird Sanctuary •Reconsider road through the area • Flood accommodation • Assess landfill
Liesbeek Park Recreation Centre	H	• Flood plain controls apply	• Retain present use • Flood protection for buildings

Name	Sensitivity Overall	Overall	
		Assessment	Recommendations
Raapenberg Bird Sanctuary	H	• Threatened by river widening • Ineffectual management	• Consolidate the different parts • New Management Plan
South Arican Astronomical Observatory	M	• Tourist Potential • Historical NB • Parts flood	• Science Park • Museum • Tourist potential
Valkenberg Hospital	A - H B - M	• Therapeutic environment • Historic importance • Avifaunal buffer area	• Open to broader public • Cycle, walking, Jogging
N-E Black River	M	• Alternative site for river widening	• Flood accommodation
Maitland Residential & Commercial Area	L	• It is cut off from study area	• Pedestrian access to open space
Alexandra C&RC	M	• Home for mentally handicapped • Historical importance	• Maintain as Rehab. Centre for handicapped • Training & Awareness campaign for staff
Maitland Garden Village	M	• Lacks amenities	• Meet needs of residents
Vincent Pallotti field	H	• Rehab. potential for indig. plants • Soil limits buildability	• Incorporate into Bird Sanctuary • Public Park
Vincent Pallotti Hospital	M	• Well utilized	• Retain as Hospital
UCT Holdings	H	• Historical area • Open space value	• No more development • Adopt IEM • Cede to CCC
Valkenberg Wetlands	H	• Underutilized picnic site • Wildlife refuge	• Incorporate into Bird Sanctuary • Expand wetland
Hartleyvale weir	H	• Popular recreation area • Important for Gulls	• Incorporate into Bird Sanctuary

Name	Sensitivity Overall	Overall	
		Assessment	Recommendations
Old Liesbeek	H	• Breeding site for kingfishers • Threatened by road widening	• Incorporate into Bird Sanctuary • Urban trail
New & widened roads	H	• Negative impact	• Pedestrian movement alternative • CB-R alternative
River widening	H	• Negative impact	• Explore alternatives of Catchment management

6.3 CONCLUSIONS AND RECOMMENDATIONS FOR THE STUDY AREA

6.3.1 CONCLUSIONS FOR THE STUDY AREA

The previous chapters illustrate that the study area consists of a plethora of land owners and land use activities, development pressures and opportunities for passive recreation and maintaining public open space.

It is argued that the value of the study area lies in its recreational, conservation (historical and biological), therapeutic open space, green lung and tourist resource potential, and should be developed as such to benefit the entire population of the greater Cape Town Metropole.

It is concluded that the area must be maintained as an open space and not used for residential, commercial or densification purposes. This is supported by the fact that the area:

- is mostly public property
- is composed of much open space which is in short supply
- will offer recreational opportunities in a densified metropolitan context

- has an existing use
- is composed mostly of flood plain
- has ecological value
- is partly composed of two highly visible ridges
- is highly visible to commuters and visitors to the city
- is highly polluted (noise, air, water) and is therefore not suitable for raising children
- has an historical character which will be destroyed by built/densified environment
- is identified by several policy documents for its recreational and open space potential
- has high land value which precludes addressing the current housing backlog
- is surrounded by already dense suburbs
- is in close proximity to other areas where densification would be more appropriate, namely, Culemborg, District Six, the Waterfront, Ysterplaat and Wingfield.

Further, the community should be involved in the management of public amenities.

6.3.1.1 Community Involvement in the management of public amenities

Community participation is a new concept for most South Africans, and with their increasing realisation of improved individual rights, this participatory spirit is likely to increase. The endeavours of voluntary non-Government Organisations have a long and respected history within the country (Fuggle and Rabie, 1983) and these organisations are dedicated in their endeavours to improve the circumstances of both humans and the natural environment. This community orientated ethic can be of to great advantage in the study area where most management tasks can be undertaken on a participatory basis to maintain lawns, cut paths, construct information boards and perform other necessary tasks.

6.3.1.2 Funding and implementation of public amenities and open spaces

An argument often levelled against the establishment of civic amenities, is one related to financing. The overarching advantage of the study area is that the implementation of the proposals contained in this dissertation need not be expensive and will in fact, over time, save the authorities a great deal of money, by avoiding river canalisation, lawn mowing and general maintenance of public amenities, through the sale of commercial products grown as wind and sound barriers etc.

It has been made clear by a number of planning and political spokespersons that such amenities will have to be independently financed within the "new" South Africa (Davidson, 1994; Watson, 1994).

The original cost of acquiring the facilities within the study area has long since been written off. The current move is for these facilities to be as self financing as possible. This for example, is the case with the Alexandra Care and Rehabilitation Centre where residents are expected to pay according to their means. However, psychiatric care and scientific facilities will still need to receive partial State financing.

The implementation of the proposals within this dissertation will assist these institutions to achieve their financing needs. For example, unused buildings can be rented for the establishment of facilities suitable for the structure. For example:

- Buildings within the eastern campus of Valkenberg, which are currently standing empty and subject to vandalism, are suitable for the establishment of dormitory type accommodation such as student residences and youth hostels. There is a critical and growing need for the establishment of an Aids and Tuberculosis Clinic and hospital for the region.

- Buildings within the SAAO could successfully be used for tea-room and restaurant facilities; a science museum or science park would be

complementary to the current activities there. These uses would bring in revenue to assist their financing needs.

- The current use of the buildings within the Liesbeek Park Recreation Centre as a mixed entertainment, social and recreational club, is proving very successful.

- The rights to use the jogging and cycle tracks throughout the study area, could be sold on a permit basis.

- An entrance charge for access to the Bird Sanctuary could be considered.

6.3.2 RECOMMENDATIONS FOR THE STUDY AREA

There are multiple potential uses for the area, it is therefore recommended that a **Policy Plan** be drawn up for the study area, which will guide future land use. The aim of the Policy will be to limit future development to meet the required open space, conservation and recreational goals. The Policy Plan should further take into account:

- existing land use policies and plans

- the environmental sensitivity of the study area

- the developmental pressures which are being brought to bear on the open space character of the study area

- the rights of the current land owners and users.

The implementation of this Policy should take the form of

- **holistic management which will be undertaken by a single authority**

- public consultation and the investigation of the legal possibilities of implementing the policy. This could possibly take the form of a Limited Development Area (LDA) or some other relevant legal mechanism under the Environmental Conservation Act 73 of 1989.

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GLOSSARY

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

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

biological indicator: an organism that can act as an indicator of environmental conditions, including pollution.

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 bed of a river

confluence: where the Black and Liesbeek Rivers join. This happens in two places, the "old Liesbeek" and the canalised section of the 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, in order to benefit posterity i.e. the conservation of nature or historical buildings.

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

development: any form of land use change, i.e. infrastructural change; or the act of causing growth, expansion and realisation of what had formerly been potential.

environment: the biophysical and socio-economic elements.

eutrophic: "well nourished", with an excess of plant nutrients.

eutrophication: the process, usually human-induced, whereby nutrients accumulate in a body of water.

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

heavy metal: metals with an atomic mass of >40.08 (i.e. greater than Calcium).

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

inversion: an increase of atmospheric temperature with height.

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

Liesbeek: the river which has its catchment in the Peninsula Chain - Devils Peak to above Kirstenbosch. Also known as Liesbeeck and Liesbeecq, Soete and Amstel.

local authority: a municipality or a division, or any other local authority established by law.

Metropole: proposed overarching body for city government in Cape Town, comprising local authorities (municipalities and others).

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

Metropolitan Open Space System (MOSS): a linked and integrated system of open spaces within a city.

oligochaete: belonging to the Oligochaeta, including the earthworms and lugworms; so-called from the small number of foot stumps on parapodia.

open space: this refers to land that has not been built on, i.e. vleis, wetlands, rivers, mountains, street verges and other undeveloped and vacant land.

package of plans: a five tiered hierarchical system of determining the best land use for an area, starting from conceptual plans, and ending with specific individual site and building plans.

Peninsula Mountain Chain: the spine of mountains extending from Cape Town to Cape Point.

planning: a method for outlining or defining goals and ways of achieving them, or the drawing up and implementation of a plan or land use plan.

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

retention dam: a construction facility to accommodate excess or flood water.

rezoning: the alteration of a zoning scheme in order to effect a change of zoning in relation to a particular piece of land.

Smokeless zone: the area extending from Groote Schuur Hospital along the N2 freeway to the Black River Parkway, along the Parkway to central Cape Town through to Camps Bay. This area has stricter air pollution standards than the rest of the City.

species diversity: a measure of the number and relative abundance of species.

species richness: a measure of the number of species with no reference to relative abundance.

state land: this refers to land owned by the State, and maintained for use by the general public.

structure plan: planning documents that stem from the Land Use Planning Ordinance No. 15 of 1985 (LUPO). LUPO defines the general purpose of these plans as follows: "To lay down guidelines for the future spatial development of an area in such a way as will most effectively promote the general welfare of the community concerned". Structure plans are not legally binding.

study area: also known as the confluence area. The area as defined in the Executive Summary of the BID.

sustainable development: development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

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

zoning schemes: control mechanisms of land use in a particular area, consisting of scheme regulations and a register with or without a zoning map.

ABBREVIATIONS

AC&RC	Alexandra Care and Rehabilitation Centre
asl	Above sea level
BID	Baseline Information Document
CAPTRUST	Cape Environmental Trust
C-BR	Culemborg-Black River
CBD	Central Business District
CCC	Cape City Council
CMA	Cape Metropolitan Area
CPA	Cape Provincial Administration
ha	Hectare
I&AP	Interested and Affected Parties
IMDF	Interim Metropolitan Development Framework
IEM	Integrated Environmental Management
MRC	Medical Research Council
M.Phil	Master of Philosophy
MOSS	Metropolitan Open Space System
pers. comm.	Personal Communication
PPP	Public Participation Process
SAAO	South African Astronomical Observatory
UCT	University of Cape Town
WCEDF	Western Cape Economic Development Forum

APPENDIX 1

1. Environmental Non-Government Organisations - 9 people interviewed

Botanical Society x 1
Cape Bird Club x 1
Captrust x 1
Cape Wetland Trust x 1
Earthlife Africa x 1
Friends of the Liesbeek x 1
Friends of Paarden Island x 1
Habitat Council x 1
Wildlife Society x 1

2. Civic and Political Organisations - 6 people interviewed

Observatory Civic Association x 1
Woodstock, Salt River, Walmer Estate Residents Association x 1
Rondebosch Civic Association x 1
Maitland Garden Village Civics Association x 1
ANC Observatory/Mowbray Branch x 1
Urban Foundation x 1

3. Civic Authorities - 18 people interviewed

Cape City Council x 14
Regional Services Council x 1
Cape Provincial Administration x 2
Pinelands Municipality x 1

4. Study Area Landowners - 6 people interviewed

Valkenberg x 1
Vincent Pallotti x 1
Propnet x 1
University of Cape Town x 1
Alexandra Care and Rehabilitation Centre x 1
South African Astronomical Observatory x 1

5. Business - 5 people interviewed

Projection Projects x 1
Rosedale Collections x 1
Olympic 2004 Committee x 1
Liesbeek Leisure Club x 1
Employers Association of Maitland x 1

6. Sports Organisations - 2 people interviewed

SA Hockey x 1
WP Soccer x 1

7. Professional Institutes - 3 people interviewed

Cape Institute of Architects x 1
Institute of Town Planners x 1
SA Institute of Civil Engineers x 1

8. Historical Societies - 3 people interviewed

Simon van der Stel Foundation x 1
Railways History Group x 1
Historical Society x 1

9. Religious - 2 people interviewed

Liesbeek Christian Action Group x 2

10. Tourist - 2 people interviewed

Captour x 1
Fairest Cape x 1

11. Planning Consultants - 5 people interviewed

Zille Shandler x 1
Aberman x 1
South African Rail Commuter Corporation x 2
Transnet x 1

12. Academic - 1 person

Fresh Water Research x 1

APPENDIX 2

CHAPTER 28 - AGENDA 21

Chapter 28 of Agenda 21- the United Nations blueprint for the environment for the next century - sets out the principles for local government initiatives in support of Agenda 21.

LOCAL AUTHORITY INITIATIVES IN SUPPORT OF AGENDA 21

Basis for action

28.1 Because so many of the problems and solutions being addressed by Agenda 21 have their roots in local activities, the participation and co-operation of local authorities will be a determining factor in fulfilling its objectives. Local authorities construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and sub-national environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilizing and responding to the public to promote sustainable development.

Objectives

28.2 The following objectives are proposed for this programme area:

(a) By 1996, most local authorities in each country should have undertaken a consultative process with their populations and achieved a consensus on "a local Agenda 21 for the community";

(b) By 1993, the international community should have initiated a consultative process aimed at increasing cooperation between local authorities;

(c) By 1994, representatives of associations of cities and other local authorities should have increased levels of co-operation and co-ordination with the goal of enhancing the exchange of information and experience among local authorities;

(d) All local authorities in each country should be encouraged to implement and monitor programmes which aim at ensuring that women and youth are represented in decision-making, planning and implementation processes.

Activities

28.3 Each local authority should enter into a dialogue with its citizens, local organizations and private enterprises and adopt "a local Agenda 21". Through consultation and consensus-building, local authorities would learn from citizens and from local, civic, community, business and industrial organizations and acquire the information needed for formulating the best strategies. The process of consultation would increase household awareness of sustainable development issues. Local authority programmes, policies, laws and regulations to achieve Agenda 21 objectives would be assessed and modified, based on local programmes adopted. Strategies could also be used in supporting proposals for local, national, regional and international funding.

28.4 Partnerships should be fostered among relevant organs and organizations such as UNDP, the United Nations Centre for Human Settlements (Habitat) and the United Nations Environment Programme (UNEP), the World Bank, regional banks, the International Union of Local Authorities, the World Association of the Major Metropolises, Summit of Great Cities of the World, the United Towns Organization and other relevant partners, with a view to mobilizing increased international support for local authority programmes. An important goal would be to support, extend and improve existing institutions working in the field of local authority capacity-building and local environment management. For this purpose:

(a) Habitat and other relevant organs and organizations of the United Nations system are called upon to strengthen services in collecting information on strategies of local authorities, in particular for those that need international support;

(b) Periodic consultations involving both international partners and developing countries could review strategies and consider how such international support could best be mobilized. Such a sectoral consultation would complement concurrent country-focused consultations, such as those taking place in consultative groups and round tables.

28.5 Representatives of associations of local authorities are encouraged to establish assistance among local authorities.

Means of implementation

(a) Financing and cost evaluation

28.6 Financing for the first activity would be at the local level. In general, donors have

not given high priority to funding for urban local authorities and the institutions that these local authorities have themselves established to provide them with training and support. International funding will play a catalytic role and be especially helpful in training, institution- building and in introducing new approaches to solving problems related to urban development and environment. In view of the projected increase in urban population and the increased proportion of income expected to be generated in urban communities, priority for funding urban programmes should be reassessed. Rather than estimate costs under this programme area the costs have been estimated in other parts of Agenda 21. UNDP and Habitat will need to be strengthened to provide secretariat services for the funding and information exchange functions. These costs are estimated at $1/million annually.

(b) Human resource development and capacity-building

28.7 This programme should facilitate the capacity-building and training activities already contained in other chapters of Agenda 21.

APPENDIX 3

THE CURITIBA COMMITMENT TO SUSTAINABLE DEVELOPMENT

An article published in the Newsletter of the International Council for Local Environmental Initiatives

On the threshold of the Third Millennium, the greatest challenge for humanity is to balance development needs and environmental preservation.

Cities are the products of dreams, visions, and great workmanship. They are centres for the creation of wealth, diverse cultures, and multiple cultures, and multiple opportunities for the individual and the collective society.

An increasing number of people are inhabiting cities. In this decade alone, an additional 500 million will become a part of urban life, and mainly in developing countries. By the dawn of the Third Millenium, one half of the world population will be urban. And millions will live in poverty, including children who as a new generation, and our future hope, deserve a fresh start in breaking this cycle of poverty.

Lack of respect for our natural systems and our inefficient extraction and consumption of valuable resources threaten the quality of life of all peoples. We have reached a state of crisis proportions.

Directions must be changed. Radical steps must be taken by the international community such as relieving the burden of international debt which itself can be a cause of environmental degradation.

Many global environmental problems are generated in cities, and so must their solutions be generated in cities. Local action is necessary for global survival.

The first step is not to make matters worse and from there, to make matters better. Solutions don't always have to be radical - creative but simple ideas can get the job done.

These ideas can be generated and developed by bringing together all segments of the community in partnership. Community participation is vital.

Cities should become "sustainable." Cities should waste the minimum and economize the maximum.

Such cities can be catalysts for change throughout the world sharing their knowledge and experience with other cities. This collective action can create a new global solidarity.
We, the leaders of local government and authorities from cities and metropolitan areas around the world make the following commitments:

Commitments

1. As a first step, work to extend basic services to all citizens without additional enviro nmental degradation.
2. Progressively increase energy efficiency.
3. Progressively reduce all forms of pollution.
4. Waste the minimum and economize the maximum.
5. Combat social and gender inequality and poverty.
6. Prioritize the needs of children and the realization of their rights.
7. Integrate environmental planning and economic development.
8. Increase involvement of all sectors of the community in environmental management.
9. Mobilize resources to increase co-operation among local authorities.

Action Plans

To fulfil the above commitments to sustainable development, it is agreed that each local authority should develop an action plan - a *Local Agenda 21* - which includes targets and timetables and incorporates measures such as the following:

- Establish a community consultation process that brings together representatives of community organisations, industry, business, professional organisations and trade unions, educational and cultural organisations, the media, and government to create partnerships for sustainable development.

- Set up an interdepartmental committee within the municipal government to co-ordinate planning, policy, and development activities so that these activities result in environmentally sound land use, transportation, energy, construction, waste, and water management practices.

- Perform regular environmental audits involving all sectors of the community and develop data banks on local environmental conditions.

- Review and improve the collection of all existing fees, fines, and taxes collected by the municipality to :- a) support sustainable behaviours and discourage non-

sustainable activities, b) charge the full environmental costs of a particular activity, andc)increase revenues available for investment in local sustainable development projects.

- Develop procurement guidelines that result in the purchasing of products and materials which are environmentally friendly.

- Establish a sustainable development curriculum to be taught in schools or other institutions under municipal jurisdiction.

- Create a forum for the further education of municipal and community leaders about environmental and sustainable development issues.

- Join and participate in regional and international networks of local authorities to increase information sharing and technical assistance among municipalities; and to press national governments to support and fund their environment and development goals.

Local authorities, cities, and metropolitian areas join forces through their associations and networks to respond to the challenges of Agenda 21, the action programme of the United Nations Conference on Environment and Development. They will prepare their action plans with targets and timetables and present a report on these plans to their respective associations within one year. This follow-up will be co-ordinated by the following associations:-

The International Union of Local Authorities
The World Association of Major Metropolises (Metropolis)
The United Towns Organization
The Summit Conference of Major Cities of the World