

DRAFT
ENVIRONMENTAL MANAGEMENT
FRAMEWORK FOR KHAYELITSHA
AND MITCHELL'S PLAIN URBAN
RENEWAL PROGRAMME

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ENVIRONMENTAL MANAGEMENT FRAMEWORK

READERS GUIDE

This EMF is made up of three main parts.

Part 1 consists of the management framework and includes:

- Summary
- Introduction
- Environmental Management Framework

Part 2 consists of the Situation Assessment. It is made up of 5 sections (A - E) which give detailed information on the strategic issues and environmental factors that should influence planning and decision making with regard to development proposals in Khayelitsha and Mitchell's Plain. The information in this section has formed the basis for the development of the EMF. The 5 strategic issues relate to:

- Management of Dunes
- Hydrology, stormwater and flooding
- Enhancement of open space systems and resources
- Air and water quality, and
- Areas of culture and heritage significance

Readers wishing to know any detailed information about these environmental issues should refer to the relevant sections of Part 2 of the document. Readers wanting to obtain information on the implications of the information in Part 2 for development planning and management, should refer to the EMF in Part 1.

Part 3 of the document consists of two annexures.

Annexure 1 provides a description of the methodology for compiling the EMF, including its scope and limitations. It also contains a description of the stakeholder consultation and awareness raising and capacity building process.

Annexure 2 describes how sustainability principles and practices can be incorporated into the urban renewal program.

Appendices 1 to 4 provide supplementary resources. These include catchment, stormwater, river and flood management guidelines, a list of the GIS metadata available for planning in storm water management areas, the EIA regulations 'listed activities' and an EMF stakeholder database.

SUMMARY

Khayelitsha and Mitchell's Plain are two adjacent areas, located in the Cape Flats, that have been identified as being urban renewal nodes. The objective of the urban renewal programme for Khayelitsha and Mitchell's Plain is to enable systematic and sustained intervention to alleviate poverty and address underdevelopment in these areas. To ensure that environmental, socio-economic and cultural factors are considered in the development process, the City of Cape Town appointed the Environmental Evaluation Unit of the University of Cape Town to assist them in preparing an Environmental Management Framework (EMF) for the Khayelitsha / Mitchell's Plain urban renewal programme. The main objectives of the EMF are to:

- identify strategic areas to be protected;
- streamline the mandatory environmental impact assessment process to enable development in appropriate areas;
- facilitate the integration of sustainability objectives into plans, policies and programmes from the outset; and
- promote integrated decision-making between all government and non-government agencies with responsibilities for land use, environmental and heritage management.

The focus and approach to the EMF is based on and in line with the relevant sections of the draft regulations for EIA to be promulgated in terms of section 24 of the National Environmental Management Act.

Essentially, the EMF is a decision-making aid and resource that should be used by both planners and authorities to plan and evaluate urban renewal (and other) projects and programmes. The EMF should not, however, be viewed in isolation. The baseline information provided in the situation assessment informed the draft Spatial Development Framework for Khayelitsha and Mitchell's Plain and other studies which are guiding development in the area, such as the vacant land study and the integrated transport study.

The development of the EMF involved the collection, review and collation of a large quantity of information from a wide variety of sources, including the City of Cape Town's environmental information system, the proposed biodiversity network and aerial photographs of the area. Important information was also obtained from the urban renewal project team, planners, and other experts familiar with the area. A parallel awareness-raising and capacity building component helped to identify strategic issues to be addressed in the EMF.

The EMF is made up of two main components, namely a management framework and a situation assessment. The environmental management framework utilizes the information from the situation assessment to identify the main environmental objectives, constraints/conflicts and opportunities for two control zones identified in the EMF. The high and medium control zones identified in the EMF largely correspond to the MOSS and biodiversity categories allocated to the area and are

aimed at giving planners, developers and other stakeholders a guide as to:

- appropriate areas for different kinds of development;
- the main environmental factors that need to be taken into account when planning for, designing and evaluating development proposals in the area; and
- identifying under what circumstances or conditions an abbreviated environmental assessment process would be appropriate.

The situation assessment provides the baseline or status quo environmental information for five strategic issues:

- (i) management of sand dunes,
- (ii) hydrology, storm water and flooding
- (iii) enhancement of open space systems and resources,
- (iv) air and water quality, and
- (v) areas of cultural and heritage significance.

All information for the situation assessment came from secondary data sources except for the cultural and heritage study, which was primary research undertaken by a member of the EEU.

The information in the EMF should be used by a wide variety of people, including project proposers, planners, members of the sub-councils and wards of the City of Cape Town, officials, and members of community groups such as the Khayelitsha and Mitchell's Plain Development Forums.

Section 2 of the EMF integrates the most relevant information from the situation assessment, identifying the key control factors to be taken into account in the processing of applications for various types of development in the two high and medium control zones.

A primary conclusion is that in some cases, it is possible that an abbreviated environmental assessment will be possible for activities listed in Schedule 1 of the existing Regulations (EIA Regulations GN No R 1182 of 5 September 1997, as amended), which trigger the requirement for an environmental impact assessment.

A change of land use or rezoning (which triggers the requirement for an environmental assessment process) from, for example, open space to residential, could be subject to a much abbreviated environmental assessment process providing that the proposed land use is in harmony with the spatial development proposals given in the draft SDF for Khayelitsha and Mitchell's Plain, and takes full consideration of the environmental factors or strategic issues described in the EMF. Urban renewal projects that are well motivated in terms of the information provided in these two documents are likely to proceed more easily through the evaluation process. The information in the EMF should also assist the Department of Environmental Affairs and Development Planning to issue comprehensive records of decision on urban renewal projects in the study area. Listed activities that are likely to have major impacts irrespective of their location or the sensitivity of the environment in which

they are placed (for example a sewage treatment plant) are likely to have to undergo a full environmental impact assessment.

This first phase of the compilation of the EMF has focused on collating and compiling the relevant information that should inform decision making in the urban renewal area. This phase has been accompanied by an introductory awareness raising and capacity building program focused on key stakeholders in the area as well as school teachers. There has been no broad based public involvement in this phase of the compilation of the EMF. The next phase will therefore focus on broadening stakeholder input into the EMF and determining means to ensure that the key information contained in the EMF is taken into account by all stakeholders involved in planning and developing Khayelitsha and Mitchell's Plain. The input of these stakeholders, as well as possible changes in the relevant legislation, may require some modifications to be made to the EMF.

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ACRONYMS

CCT	City of Cape Town
CMA	Cape Metropolitan Area
CN	Cape Nature
DOA	Department of Agriculture
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessments
EMF	Environmental Management Framework
KDF	Khayelitsha Development Forum
MPDF	Mitchell’s Plain Development Forum
SDF or URSDF	Spatial Development Framework (for Khayelitsha and Mitchell’s Plain) or Urban Renewal Spatial Development Framework (for Khayelitsha and Mitchell’s Plain)
URP	Urban Renewal Program

SECTION 1
INTRODUCTION

1. SECTION ONE

INTRODUCTION TO URBAN RENEWAL AND THE ENVIRONMENTAL MANAGEMENT FRAMEWORK

1 OVERALL GOALS OF THE ENVIRONMENTAL MANAGEMENT FRAMEWORK

In February 2001, President Thabo Mbeki announced the establishment of a National Urban Renewal Strategy.

The National Urban Renewal Strategy is the responsibility of the National Department of Provincial and Local Government. The overall objective of the programme is to enable a systematic and sustained intervention to alleviate poverty and significantly address underdevelopment in the various urban nodes, two of which are Khayelitsha and Mitchell's Plain.

*'The urban renewal programme is an integrated process targeting the **regeneration** of underdeveloped geographic areas to achieve **sustainable development** by bringing a **balance** between the **social, economic, environmental** and infrastructural aspects of City Life'* (Presidential Urban Renewal Programme Business Plan).

In 2003, an urban renewal business plan was drawn up to enable systematic and sustained intervention to alleviate poverty and address underdevelopment in the Khayelitsha and Mitchell's Plain areas.

The City of Cape Town identified the need for a careful assessment of the environment as part of the urban renewal programme. A need to identify strategic areas to be protected and means to streamline processes to enable development in appropriate areas. The City thus appointed the Environmental Evaluation Unit of the University of Cape Town to assist them in the process of compiling an Environmental Management Framework (EMF) for Khayelitsha and Mitchell's Plain.

The main purposes of this EMF were to inform procedural and spatial aspects and implications of the urban renewal programme from a strategic environmental and heritage perspective. A key objective of the EMF is to guide and focus and thereby streamline the mandatory Environmental Impact Assessment that is required before certain developments can proceed. The EMF is also intended to facilitate the integration of sustainability objectives into plans, policies and programmes from the outset and enable the integration of environmental issues with economic and social issues. It promotes integrated decision-making between all government and non-government agencies with responsibilities for land use, environmental and heritage management.

Presidential Urban Renewal Programme

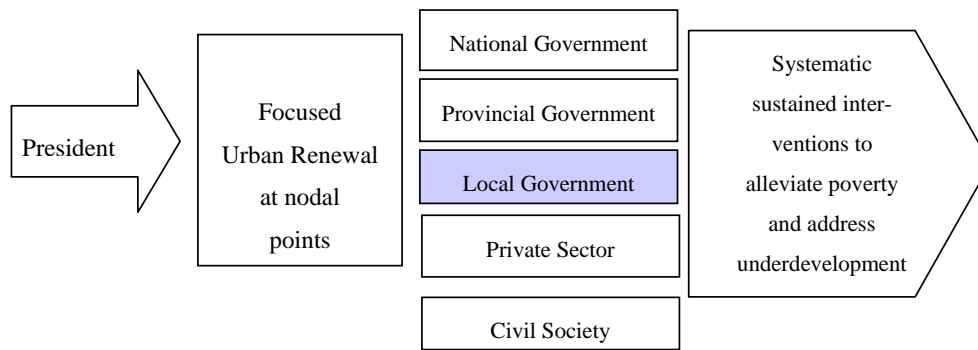


Figure 1.1: The presidential urban renewal program

Urban renewal is a process in which a community develops partnerships, attitudes and ongoing actions that strengthen its natural environment, economy and social well being. Benefits include more liveable communities, lower costs and a safe environment for future generations¹.

According to the Urban Renewal Business Plan, the programme is required to:

- mobilize people to become active participants in the processes targeted at the upliftment of their own communities
- coordinate and focus activities of the three spheres of government
- secure private sector co-operation and participation in the programme
- reprioritize and re-align budgets and expenditure of the three spheres of government, in particular spending on poverty relief, infrastructure development, maintenance and rehabilitation, and
- pilot approaches to ensure cluster and inter-cluster as well as cross-sphere approaches to planning, budgeting and implementation.

2 INTRODUCTION TO THE STUDY AREA: KHAYELITSHA AND MITCHELL'S PLAIN

(The following information on Khayelitsha and Mitchell's Plain has been summarised from the Urban Renewal Business Plan for Khayelitsha and Mitchell's Plain).

The study area for this report is comprised of Mitchell's Plain and Khayelitsha, two low income and neighbouring residential areas located in the south eastern part of the City of Cape Town area. The study area is bounded by Phillipi horticultural area to the west (includes Strandfontein), and the False Bay coastline to the south and follows the cadastral boundary of Khayelitsha along Baden Powell Drive in the east and up to the N2 and the R300 (Cape Flats Freeway) in the North. Please refer to Map of the area.

Khayelitsha

¹ Urban Renewal Business Plan for Khayelitsha and Mitchell's Plain.

Khayelitsha is a Xhosa name meaning a 'new home'. Khayelitsha was established in the early eighties by the apartheid government in order to accommodate the African people that lived in and around the Cape Metropolitan area. The predominant planning objective that shaped Khayelitsha was containment and isolation. Khayelitsha was thus situated far from the centres of economic opportunity and on land that is costly to develop and live in (for example sandy, exposed, high water table, periodic flooding).

The majority of Khayelitsha's community is poor and living under extremely difficult conditions. Since inception, Khayelitsha has grown at a phenomenal rate to accommodate an influx of people from the Eastern Cape. Originally planned for a population of 250 000 residents, Khayelitsha is home to an estimated 600 000 people (far more than counted during the 2001 census). Some stakeholders estimate the population to be 1 million. A comprehensive social profile of Khayelitsha (based on an analysis of the census data) is available from the City of Cape Town's strategic information department.

Mitchell's Plain

Mitchell's Plain was planned and built as a completely new town in the 1970's to alleviate housing shortages in the coloured communities of Cape Town. It was planned as a self-sufficient dormitory town far from the city. Like Khayelitsha, it was planned to accommodate about 250 000 people and according to the 2001 census, has a population of about 289 554 people. As in Khayelitsha, distance from the city makes the population highly reliant on public transport, but in Mitchell's Plain, there is an excess of unsafe high order freeway type roads, low residential densities with an excess of open space and a design layout which does not facilitate neighbourhood surveillance, resulting in a community safety problem. Poverty and unemployment are rife and social crime is a major issue.

Both nodal areas were planned to be 'separate' under previous apartheid policies and there is therefore an unbalanced urban structure. This social exclusion therefore has to be addressed. In addition, the rapid pace of 'low cost' development, as well as the accelerated influx into these two areas did not allow for comprehensive consideration of the opportunities and constraints posed by the harsh conditions of the natural environment. Dunes and drainage systems were simply bulldozed. The replacement storm water control system is regularly blocked with sand and litter, resulting in localized flooding. People are living in homes that are not designed to withstand the harsh weather conditions. In Khayelitsha, use of wood and other fossil fuels to generate heat is causing poor air quality. All these factors are contributing to a decline in health and welfare. People's ability to support themselves and improve their circumstances is compromised. There are long term impacts on the economy as significant resources have to be allocated to supporting dysfunctional environments and communities. An integrated and holistic approach is thus needed to address the imbalances of the past.

The national vision towards which the communities of Khayelitsha and Mitchell's Plain should be heading is '*attaining socially cohesive, resilient and stable rural and urban communities with viable institutions, sustainable economies and universal access to social amenities, able to attract and retain skilled and knowledgeable people who are equipped to contribute to growth and development*' (National vision,

presidential urban renewal programme).

The Khayelitsha and Mitchell's Plain communities have summarized their vision for the area to be:

'With our own skills, we shall improve our lives and the lives of generations to come'.

This vision reflects a desire for self driven self-improvement, now and in the future. Utilisation of planning documents such as the Spatial Development Framework and the Environmental Management Framework will assist in this process.

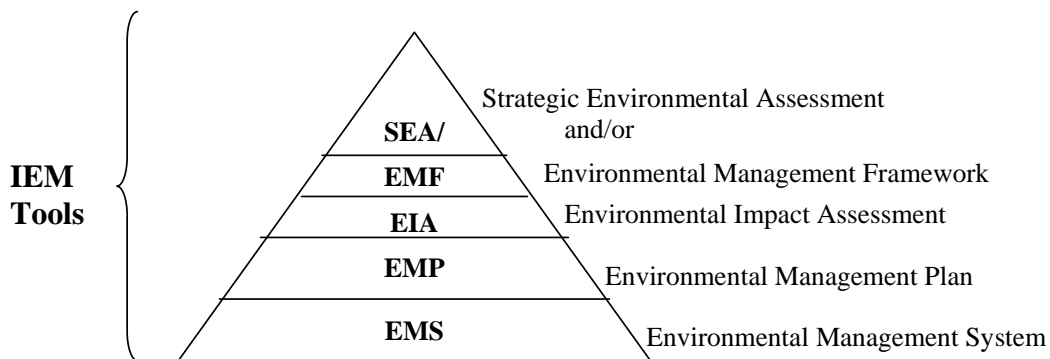
3 INTRODUCTION TO THE ENVIRONMENTAL MANAGEMENT FRAMEWORK

3.1 Environmental Management Framework as a decision-making aid

The Environmental Management Framework is part of the broader framework of Integrated Environmental Management (IEM), a philosophy and process that has been designed to ensure that the environmental consequences of development are understood and adequately considered in the planning, implementation and management of all developments. IEM is intended to guide, rather than impede the development process by providing an approach to gathering and analysing information, and ensuring that it can be easily understood by all interested and affected parties. The purpose of IEM is to resolve or lessen any negative environmental impacts and to enhance positive aspects of development proposals.

One of the many tools that can be used to assist in achieving integrated environmental management is the Environmental Management Framework (EMF). At its simplest, an EMF is a set of information that can be used by decision makers to assist them in determining the best approaches (either procedural and/or technical) to dealing with a variety of environmental challenges. Such challenges might include determining what investigations or processes need to be followed for authorities to make informed decisions about development applications. The EMF can also help to identify what range of factors needs to be taken into account in specialist studies undertaken as part of Environmental Impact Assessments (EIAs) for various development proposals. In addition, EMFs can indicate where different types of development are suitable or unsuitable for different kinds of environment.

The relationship of the EMF to other environmental assessment and management tools is shown in the diagram below.



Preparing an EMF can inform planning in that it can

- provide a strategic overview and assess scenarios (much like a SEA, but with a strong environmental focus and usually with greater spatial delineation than the SEA).
- clarify strategic issues (e.g. provide more detail on strategic issues identified in a SEA).
- draw links between various IEM tools: EMF – EIA – EMP.
- reduce the number and complexity of EIAs.

In some cases, the information in the EMF could allow the EIA stage to be bypassed or shortened and proceed straight to the compilation of an EMP. It is proposed that a generic EMP be compiled for urban renewal in Khayelitsha and Mitchell's Plain.

3.2 Legislative context

The National Environmental Management Act 107 of 1998 (NEMA) (as amended) aims to 'provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment'. Chapter 5 of NEMA sets out the specific objectives of integrated environmental management, one of which is to 'ensure the consideration of environmental attributes in management and decision making which may have a significant effect on the environment'. Section 24 (2) of NEMA allows the Minister to 'prepare compilations of information and maps that specify the attributes of the environment, in particular geographical areas, including the sensitivity, extent, interrelationship and significance of such attributes, which must be taken into account by every organ of state charged by law with authorising, permitting or otherwise allowing the implementation of a new activity, or with considering, assessing and evaluating and existing activity'. The EMF is one of the tools that can be used to alert developers and authorities as to the key environmental attributes of an area that need to be taken into account in the planning and development processes.

According to chapter 5 of the draft proposed EIA regulations under section 24(5) of the National Environmental Management Act an EMF has several purposes. These are shown in box [insert](#).

(Note: the information below has been extracted from the draft regulations. Revision may be necessary once the final regulations are published).

Box 3.2.1: Purposes of an EMF

- (a) To assess and document the environmental attributes of a defined geographical area in sufficient detail to enable the Minister or MEC to make an informed decision regarding the need for environmental authorization in respect of specific activities;
- (b) identify conservation and environmental management priorities within a defined geographical area to facilitate the implementation of measures that support the management of such priorities
- (c) identify specific areas or aspects that should be managed or protected;
- (d) identify environmental considerations that should be taken into account in the formulation of strategic development frameworks and integrated development plans;
- (e) provide information in respect of land uses that are, or are not, appropriate for the area, having regard to the environmental attributes of the area; and
- (f) facilitate co-operative governance with respect to decision-making and the management and protection of the environment.

In summary, EMFs are intended primarily to streamline planning and decision-making processes in order to enable more sustainable development in appropriate areas.

In this report the environment is interpreted in its broadest sense to include social, biophysical and cultural aspects of the study area and the interaction of these, in line with the NEMA definition of environment and the environmental rights guaranteed in the Constitution (Act 108 of 1996). This approach assists in promoting an integrated understanding of current environment conflicts and opportunities within the study area.

3.3 The relationship of the EMF to other planning documents

The EMF for Khayelitsha and Mitchell's Plain is one of a suite of documents that should be used to assist in forward planning, land use management and building control processes. The main document complementary to the EMF is the draft Spatial Development Framework (SDF) for Khayelitsha and Mitchell's Plain. The SDF guides spatial development in Khayelitsha and Mitchell's Plain, specifically promoting integrated consideration of the two areas. Another key resource document will be the Vacant Land Study for Khayelitsha which will provide detailed information on the open spaces in Khayelitsha (phase 1, which is complete) and how they should be utilized (phase 2, which is currently underway). The main projects and their outputs are shown in the diagram below.

All the above documents are meant to inform the compilation of the Integrated Development Plan (IDP), as well as the roll out of the urban renewal business plan.

Information in this EMF underpinned the draft urban renewal SDF such that the two planning and management frameworks are aligned.

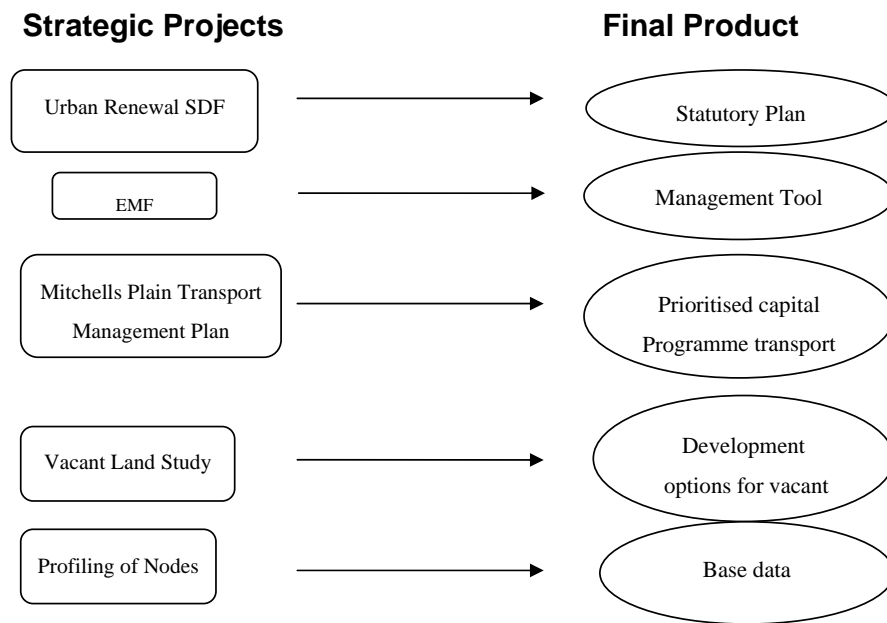


Figure 3.3.1: Strategic projects and their final products

The EMF is thus an information resource and planning tool that must be utilized in conjunction with the SDF and other relevant planning and policy documents. It is a source document that will assist planners, developers and government authorities to better understand the constraints and opportunities presented by the environment within Khayelitsha and Mitchell's Plain. Better understanding should result in better planning and implementation of urban renewal (and other) projects, enhancing the sustainability of the Urban Renewal programme.

3.4 Structure of the EMF

The EMF is made up of two main parts, namely:

- The management framework, which uses information from the situation assessment to identify two control zones which should influence development types and environmental evaluation processes.
- A situation assessment which provides information about the key environmental factors that need to be taken into account in planning and developing the remaining open space in Khayelitsha and Mitchell's Plain.

The EMF is divided into 7 sections.

Section 1 introduces the urban renewal study area and the EMF.

Section 2 comprises the management framework component of the EMF which draws on the baseline information presented in Sections 3 – 7 (the situation assessment) to identify control zones for the area and the implications thereof. The section identifies

key objectives for each of the two control zones, key areas needing priority attention, key areas of potential conflict as well as appropriate land uses and areas of opportunity. The overall conclusions of the EMF are given at the end of this section.

Sections 3 to 7 comprise the situation assessment component of the EMF. These sections describe the status quo with regard to 5 strategic issues that need to be taken into account in planning and implementing development in Khayelitsha and Mitchell's Plain, namely dune systems (section 3), hydrology, storm water and flooding (section 4), enhancement of open space systems and resources (section 5), air and water quality (section 6) and sites of cultural and heritage importance (section 7).

Annexure 1 provides a description of the methodology for compiling the EMF, as well as a description of the stakeholder consultation and capacity building process. It also identifies the scope and limitations of the EMF data.

Annexure 2 provides a means to incorporate sustainability principles and practices into the urban renewal programme.

SECTION 2

**ENVIRONMENTAL MANAGEMENT
FRAMEWORK FOR THE KHAYELITSHA
AND MITCHELL'S PLAIN URBAN
RENEWAL PROGRAMME**

2. SECTION TWO

ENVIRONMENTAL MANAGEMENT FRAMEWORK FOR THE KHAYELITSHA AND MITCHELL'S PLAIN URBAN RENEWAL PROGRAMME

1. INTRODUCTION

Sections three to seven of this report describe the key environmental factors that need to be taken into account when planning and implementing urban renewal (or other) projects or programmes proposed for the area. This section of the report presents the implications of the information provided in sections 3 to 7 for planning and environmental management. Guidance will be given on the areas most suitable for various types of development. In addition, the key constraints and opportunities that need to be considered when assessing the appropriateness of development proposals in this geographical area will be identified.

Given that one of the purposes of an EMF is to facilitate more efficient and sustainable development by simplifying the environmental assessment application and evaluation process, this section will also describe the current process and show how information from the EMF can be used to facilitate the development application and decision making processes. It should be noted however, that the EMF cannot predict or indeed dictate what kind of development applications will be coming forward for the area and therefore the information provided cannot be site or development specific. Reference should be made to the Spatial Development Framework for Khayelitsha and Mitchell's Plain for guidance on development principles and nodes for urban renewal.

2. USING THE EMF TO GUIDE EIA PROCESSES

The following section describes the environmental assessment process and shows how the EMF can be used to inform the processing of development applications.

2.1 A summary of the main steps in the Environmental Assessment process and the relationship between the EIA process and the EMF

2.1.1 *The Environmental Impact Assessment Regulations and the processing of development applications*

<p><i>NOTE: This section will need to be revised upon enactment of the new EIA regulations</i></p>
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The Environmental Impact Assessment Regulations, issued to give effect to sections 21, 22 and 26 of the Environment Conservation Act (1989) require that an environmental assessment process be carried out for any 'listed' activity. These listed activities (see Appendix 1) generally involve actions which are likely to cause significant impacts on the environment, for example, roads, railways, canals, water abstraction for bulk supply, sewage treatment plants and so on. However, there are also certain 'listed activities' which are less specific, for example the change of land use from 'agricultural or zoned undetermined use or an equivalent zoning to any other land use'. The change of land use thus triggers the requirement to follow the environmental assessment process. Even if the proposed change of land use is environmentally and socially more acceptable than the previous land use, the environmental assessment process still has to be followed. This process is summarised in box 2.1.1.1.

Box 2.1.1.1: Summary of the environmental assessment process

1. The proponent completes an application (screening) checklist and submits this to the Department of Environmental Affairs and Development Planning (DEA&DP). (In some cases, they may submit the application to the national Department of Environmental Affairs and Tourism).
2. DEA&DP evaluate the application and advise the proponent on the appropriate way forward.
3. If an environmental assessment process has to be followed, the proponent has to complete a Plan of Study for Scoping (POS) and appoint an independent consultant to facilitate the process.
4. DEA&DP will review the POS for scoping and if acceptable, the proponent can proceed with undertaking the scoping process. This results ultimately in the compilation of a final scoping report which is then reviewed by the authorities. If the scoping report is accepted, and is considered to provide sufficient information, DEA&DP can issue a decision on the project on the basis of the scoping report. If they determine that there are issues and alternatives that require further investigation, the assessment continues into the environmental impact assessment (EIA) phase.
5. The proponent's consultant prepares a plan of study (POS) for the EIA. This is reviewed by the authorities, and if accepted, the consultants proceed with the environmental assessment. An EIA report is produced and after review by DEA&DP, is accepted or rejected. The authorities issue a Record of Decision (ROD), stipulating the conditions under which the development may proceed or reasons for refusal.
6. The proponent and public have an opportunity to appeal the ROD.

The above is a much simplified explanation, but gives an indication of the key steps involved in the environmental assessment process. Delays are caused in the process if insufficient, biased or inaccurate information is supplied to the relevant authority (e.g. DEA&DP). This forces the authority to return whatever document has been submitted (application forms, Plan of Study for scoping or EIA, scoping and / or EIA reports) to the proponent or his/her consultant. Reasons for submission of poor quality documentation are varied, but one of the reasons can be the absence of good quality information to inform any of the various documents.

A key function of the EMF is to provide baseline information that can be used to inform development applications and the environmental assessment process. If stakeholders are aware of the various opportunities and constraints presented by the various attributes of the environment they are working in, there is a much better likelihood of a development proposal being submitted that is appropriate to the environment within which it will be located. There is also a greater likelihood that the development application will be rapidly processed and accepted. The conditions that accompany the ROD are also likely to be less onerous.

2.1.2 The EMF as a tool to assist in the processing of development applications

Development applications within the spatial delineation of an EMF are usually high priority developments influenced by strong political motivations e.g. the N2 Gateway Project, and thus often need rapid decisions.

However, the implementation of the EIA regulations must follow due process and remain consistent and be carried out within the current legislative framework. There is a need for access to consistent, comprehensive, good quality information to enable the relevant authorities to make an informed decision timeously.

This legislative process has the potential to be assisted, where appropriate by an EMF. This will facilitate an easily informed rapid review of applications and thus a better service delivery to the Province, assisting in the realisation of Ikapa Elihlumayo and many other strategic service delivery vehicles in the Province. The EMF can facilitate a strategic overview of the region enabling informed forward planning to realise the triple bottom line of environmental, social and economic sustainability.

EMF should never be used on its own. It is a tool to guide planning and possibly speed up the processing of applications. If an EMF is to be used as a screening tool and achieve its potential benefits, extensive public and stakeholder participation is first needed.

2.2 The use of Control zones to assist in choices with regard to the level of environmental assessment required

The above sections have explained the environmental impact assessment and EMF tools. One of the key objectives of the EMF is to provide sufficient information about the environmental attributes of a the urban renewal node areas of Khayelitsha and Mitchell's Plain in order to assist the environmental authorities to determine the need for environmental authorization in respect to specific activities. There is a wide variety of listed activities which will need to go through an environmental impact assessment process because of the scale or nature of the activities involved. However, there are also certain categories on Schedule 1 of Regulation 1182 in terms of Section 21 of the Environmental Conservation Act (1989) or the "List of Activities" which

will trigger the requirement for an environmental assessment which might be argued as being unnecessary.

For example, change of land use from being zoned for public open space to being zoned for residential use will trigger the need for an environmental assessment process. An EIA is required regardless of the development or environmental context. However, should there be large tracts of undeveloped open space in an area, as found in certain parts of Mitchell's Plain and Khayelitsha, then residential or mixed use development might be considered a more appropriate land use than public open space. An abundance of unmanaged public open space has been found, particularly in these areas, to be a hazard from a safety perspective, due to the flourishing of criminal activities.

In this regard, both the Cape Metropolitan Open Space System (CMOSS) and the Biodiversity Network have been included in the EMF, together with other key open space functions such as stormwater management.

Although residential development has the potential to cause environmental impacts, these can be mitigated if:

- the development is appropriately located, designed and managed, and
- appropriate planning of open space needs has occurred. Environmental Management Plans set out the required environmental controls.

In this example, an application for a change of land use for the purposes of housing would, (legislation permitting) be reviewed in terms of information provided in the EMF and the SDF, rather than through the gathering of additional information through an EIA. Provided the proposed land use and development controls support sustainable development, and take into account the environmental constraints and issues raised in the EMF and SDF, a Record of Decision (ROD) could be issued. Information available through the EMF and SDF might be compiled in an application checklist, or if some level of evaluation and/or development control is required, a Scoping report and Environmental Management Plan may be necessary. In this case, the need for an environmental impact assessment has been removed. However, should the proposed development be an activity which is inconsistent, for example involve pollution, then the normal environmental assessment process would be needed to make an informed decision.

2.3 Description of the Control zones

In order to assist in the decision making process with regard to determining the need for an environmental impact assessment, the Khayelitsha/Mitchell's Plain area has been divided by the project team into two control zones – as shown on map 1a. These zones are a high control zone and a medium control zone. The extent and implications of these two zones for the development and environmental assessment processes are explained below.

2.3.1 The High Control Zone

This zone falls largely into and corresponds with areas which have been demarcated as 'Non-negotiable' MOSS as well as areas identified in the Biodiversity network as being of high priority (namely the A category areas) (see section 5, subsection 1.2 for a description of the Biodiversity network). Areas that are not suitable for development, such as the embryo dunes, the most important parts of the aquifer and pans and wetlands also fall into the high control zone. There are also some isolated remnant wetlands, which receive a high sensitivity rating in the hydrological map, which fall outside the main high control zone (in northern Mitchell's Plain) and which therefore should be protected from inappropriate development.

The high control zone extends predominantly along the coast, with three extensions inland, the first one linking the coast to the Phillipi horticultural area and some remnant dunes in western Mitchell's Plain, the second one extending to the Swartklip site and another extending up the eastern side of Khayelitsha linking the coast with the Kuils river and Khayelitsha wetlands. On the coast, the high control zone includes the Strandfontein coast, the Wolfgat Nature Reserve, the Monwabisi coast and the Macassar dunes.

2.3.2 The Medium Control Zone

The medium control zone is comprised of the remainder of the study area and falls largely into the inland areas. The medium control zone is generally suitable for development but contains areas with a High and Medium MOSS rating and areas with the category B and C Biodiversity priority ratings. It also contains areas that are unsuitable for development, such as the storm water network detention ponds. Most of the highly rated MOSS areas form part of, or are linked to, the storm water system or larger open spaces. Development in these MOSS and Biodiversity rated areas has to be conceptualised and designed in such a way that the opportunities and constraints imposed by environmental factors are taken into account.

2.4 Development opportunities within the control zones

In broad terms, the types of development most suitable for the two control zones are as described below.

2.4.1 The high control zone

The high control zone is an area that presents a vast amount of opportunity for the sustainable utilisation of open space and space extensive activities which can bring many socio-economic benefits, both in terms of sustainable job creation, but also an improvement in quality of life for the surrounding communities. Although the high control zone is generally not suitable for urban development except in specific

identified nodes such as the recreational resort nodes (as identified in the SDF), the opportunities presented by this land (e.g. for recreation and conservation) are potentially sustainable and bring benefits at both local and global levels. The high control zone is an area which should be retained essentially in its natural state, and where this state has been significantly disturbed, efforts should be made to restore it to its natural state or at least a state that meets the aims of retaining a green corridor which conserves as much of the biodiversity as possible. Linkages between this area and the inland high rated MOSS areas should be retained wherever possible, particularly if the high rated MOSS areas are well connected forming a series of linkages between storm water and open space areas from north to south through the area.

The broad land use guidelines that apply to biodiversity category A areas that are given in section 5 of this document are also applicable to the high control zone. They are repeated here for convenience.

The following broad guidelines should be applied to all of the Category A areas (all of which occur within the high control zone):

- Restore/maintain as natural landscapes, and prevent land uses that transform these qualities
- Avoid motorized access and control access on foot.
- Maintain wild, remote and wilderness experiential qualities (practically, this will not be possible in all instances of category A sites, probably only in the largest sites)
- Promote consolidation of the conservation estate and prohibit further fragmentation (i.e. no sub-division).
- Facilitate co-management arrangements between private landowners and conservation authorities.
- Identify opportunities for rates rebates where landowners enter into a conservancy agreement with Cape Nature.
- Limited scope for negotiated agreements, preferable to use fiscal incentives (e.g. rates rebate) where limitations sought on existing land use rights.
- Cluster essential structures and facilities, and locate on the periphery of core conservation areas.

The high control zones, although not suitable for urban development, can be used for a wide variety of purposes that are managed such that they do not have a detrimental effect on the environment. This would include for example, use of the areas for environmental education, controlled harvesting and cultivation of medicinal plants as well as plants that are used for craft and building purposes (e.g. baskets and thatch), initiation sites, passive recreation activities such as hiking trails, etc. Reference should be made to the recommendations contained in the Wolfgat - Macassar node report (2005²) on appropriate land uses and economic initiatives for this area. Areas

² City of Cape Town Environmental Management Department (2005). Empowering Local Environments – Realising Social and Economic Benefits for the False Bay Coast: Implementing the Southern Component of Cape Town’s Biodiversity Network. Abstract – Macassar Node: Concept

of opportunity are also identified in the following section of this chapter.

Within the high control zone, there are areas that are either heavily degraded or already developed. These include for example, the mined out Swartklip mine on the Swartklip site, the fringes of the Swartklip site, the Coastal Park landfill facility and the resort nodes of Mnandi and Monwabisi. These areas provide opportunities for social and recreational facilities, particularly those facilities linked to the recreational and resource potential of the adjacent areas.

2.4.2 The medium control zone

The medium control zone represents the area suitable for most future urban development. No particular limitations are placed on development in this area other than those dictated by the site specific constraints imposed by the natural and created environments.

The biodiversity network categories B and C fall within the medium control zone. There is only one small B category biodiversity area just outside the study area adjacent to the Kuils river (refer to control zone map). Because of the area's vulnerability to flooding it is an exception and is in fact included within a high control zone. The biodiversity network has also listed broad land use guidelines for category C areas. These are given in section 5, Box 3.1 but are repeated here for convenience.

The following broad guidelines should be applied to all Category C areas:

- Maintain as urban transition zones and prevent intrusion of urban land uses.
- Manage form, coverage and intensity of land use to preserve rural character of landscapes.
- Controlled access with restrictions on motorised access to environmentally sensitive areas.
- Promote land consolidation and discourage further sub-divisions.
- Facilitate co-management arrangements between private landowners and conservation authorities for the maintenance of ecological patterns and processes.
- Negotiate land use agreements with landowners and stakeholders that result in the protection of the area's significant environmental attributes.
- Use fiscal instruments to incentivise biodiversity friendly land uses.
- Consent use for land uses that do not compromise environmental standards, subject to positive EIA and compliance with performance standards.

The biodiversity guidelines point out that should a category C area fall onto a MOSS non-negotiable area (as happens in the Monwabisi dunes area north east of Wolfgat Nature Reserve), then development should not be supported. However, it also states

Spatial and Management Framework. Prepared by Settlement Planning Services (Western Cape) and Sanhe Eco-nomics.

that the specifics of suitable alternative land uses can best be informed by an understanding of the local context. Socio-economic and spatial considerations thus have a bearing on what land uses are appropriate, and these are best identified through local area and sub-regional spatial development frameworks. The fact that the area does fall into a Non-negotiable MOSS area requires that any development proposal be conceptually designed in order to take account of the particular limitations and opportunities posed by this combination of ratings (C biodiversity and Non-negotiable MOSS).

More details on the opportunities and constraints that need to be taken into account in the medium and high control zones are given below.

2.5 Key control factors to be taken into account in the processing of applications for various types of development in the two control zones

Reference may be made to map 1b which depicts the key opportunities and constraints relevant to the urban renewal area.

HIGH CONTROL ZONE
<p>Key Objectives</p> <ul style="list-style-type: none"> • Maintenance and improvement of the biodiversity of the area • Protection of the False Bay coastal corridor as a public amenity and functional biodiversity corridor • Linkages between open spaces and green corridors (east west and north south) • Functional linkages of open space system to inland storm water control system • Conservation of key resources (such as the water in the aquifer) to enable future use • Restoration of degraded habitat and resources (such as the Khayelitsha wetlands) in order to improve their resource value in terms of ecosystem function, amenity and recreational value • Prevention of linear ribbon development outside the key resort nodes located within the high control zone • Maximisation of socio-economic opportunities to sustainably utilise natural resources and processes • Improvement of safety, security and community knowledge and ‘ownership’ of and pride in the open space areas and its resources. • Establishment of interpretive signage.
<p>Key areas needing priority attention</p>

<ol style="list-style-type: none"> 1. The Monwabisi dune area east and north east of the Wolfgat Nature Reserve. This area is being encroached upon by informal settlement. 2. The Swartklip site, which is regarded as an ‘exploration’ area in the SDF. There is a need for a planning process to clarify the long term opportunities and appropriate use of the strategically located land. 3. The remnant dunes and high rated MOSS sites on the western boundary of Mitchell’s Plain 4. The areas above the most sensitive parts of the aquifer, particularly the Coastal Park landfill site and cemetery. 	
<p>Key areas of potential conflict</p>	
<ul style="list-style-type: none"> • The past utilisation of a key aquifer site for a landfill site and the current planned expansion of the cemetery • Encroachment of informal settlements onto the Monwabisi dunes area east of Wolfgat Nature Reserve • Pressure from some sectors of the community to remove remnant dunes on the western boundary of Mitchell’s Plain • Development of transport infrastructure, including possible future roads and railway extensions • Pressure to develop parts of the Strandfontein dune area • Illegal sand mining in the dunes area west of the Macassar dunes • Pressure to develop into flood prone areas particularly in the Khayelitsha wetland area • Settlement in areas prone to flooding. 	
<p>Appropriate land uses and areas of opportunity</p>	
Strandfontein dunes area	<ul style="list-style-type: none"> • This area is not entirely pristine but forms an important part of the coastal corridor which needs to be maintained. Suggested land uses include picnic sites, hiking trails, a camping site, and if feasible, cultivation of medicinal, craft (e.g. for baskets) and building (thatch) plants.
Mitchell’s Plain remnant dunes	<ul style="list-style-type: none"> • It is suggested that there be integration of remnant dunes into the open space system, with adoption and utilisation of dunes by surrounding community (similar to the Dagbreek dune initiative). However, an integrated dune usage and management plan is needed which must be agreed upon with the affected communities.
Wolfgat Nature Reserve	<ul style="list-style-type: none"> • Nature reserve purposes as per management plan (conservation, education and recreation)
Monwabisi dunes east and north east of Wolfgat	<ul style="list-style-type: none"> • This is an area of opportunity. An integrated plan is needed for the area. It is suggested that this area be utilised for a combination of initiation sites, as well as resort and recreation purposes provided the two can be designed in such a way that they are not incompatible. It is suggested that some provision be made for a sensitively designed and located residential component in order to remove pressure elsewhere and cater for the more affluent section of the property market. However, as the area is a category C biodiversity area and falls within a MOSS Non-negotiable area, the type, location, design, construction and management of any

	proposed developments have to be carried out with full cognisance of open space, biodiversity and coastal corridor maintenance requirements.
The Coastal Park landfill and cemetery sites	There is currently a transfer station which is of strategic importance on the landfill site which is essential for efficient service delivery. Any development on this site will need to take the limitations imposed by past land use (landfill site) into consideration, as well as the current and future waste management requirements. The land will have to be used for open space purposes. The optimal use has still to be determined. The most sensitive/important parts of the aquifer are located below this site. Any development proposals should therefore not compromise water quality any further. Expansion of the cemetery will require preparation of an environmental impact assessment. A scoping phase and land use change application are presently underway. Means to address the pollution potential are being addressed by locating the graves in higher lying areas and in some areas using a cut and fill process to ensure graves are at least 2 metres above the winter water table.
The Swartklip site	<p>This is identified as an exploration site in the draft SDF that needs an integrated development plan. Current proposals are to allow some residential development on the fringes of the site (see SDF) in the degraded areas with the rest of the area being developed as a regional multi-purpose park. There are also investigations underway to find a suitable route for a railway line which will be used to transfer waste. An environmental impact assessment will be needed to identify the alternatives and respective impacts.</p> <p>Some key strategic questions that need to be addressed in the development of a plan for the site are:</p> <ul style="list-style-type: none"> • What role the site can play in facilitating integration of the Mitchell's Plain and Khayelitsha communities • How the key biodiversity areas of the site can be protected from encroachment (particularly if the Denel security component is removed) • How areas polluted through past land uses should be treated • How the use of this site relates to use of other natural areas in the vicinity such as the Wolfgat and Driftsands Nature Reserves. • How the proposed railway line can be accommodated without damaging the ecological integrity and multi-purpose function of the site.
The Mnandi, Monwabisi and future Kapteinsklip recreational resort nodes	<p>Current proposals are for mixed use recreational resorts with supporting infrastructure. These areas present significant opportunities for economic development and job creation.</p> <p>Key strategic and development design questions that need to be addressed in further developing or upgrading these areas are:</p> <ul style="list-style-type: none"> • Consideration of means to ensure that the developments meet community needs and do not exclude access to the coast by the poorer sectors of the community • Determination of an appropriate development edge beyond which development will not occur • Determination of means to address sand and beach erosion and deposition problems

	<ul style="list-style-type: none"> • Determination of an appropriate green corridor through the resorts to maintain green corridor continuity along the coast (can be developed, but should preferably be indigenous park type development that is integrated into the resort design) • Appropriate conceptualisation and design to allow for recreation throughout all seasons and consideration of means to make the recreational areas more livable (i.e. need to fully consider sun, wind, wave and sand dynamics and design and construct accordingly). Full utilisation should be made of sustainable construction design and methods • Consideration of inclusion of a limited residential component to ensure a constant presence • Consideration of the possible long term impact of climate change, sea level rise and more extreme storms and weather events.
<p>The Macassar Dunes area</p>	<p>The north eastern portion of the dunes are being mined for sand. This will probably continue for another 20 to 30 years, depending on demand. The mine sites are to be backfilled to enable a variety of land uses, including an eastern extension of Khayelitsha.</p> <p>The southern and western parts of the dunes are intended as a conservation area with community use. Development opportunities that involve the creation of high order amenities based on the value provided by the rich biodiversity and threatened habitats of this area exist. Eco- trails incorporating elevated wooden board walks through the dunes and along the coastline, bird hides, viewing points across False Bay, an educational centre and signboards, as well as a tourist refreshment area could, for example, contribute towards the creation of a high order amenity that simultaneously retains a core botanical hotspot of worldwide significance.</p> <p>The Macassar Dunes has further potential for development opportunities incorporating sustainability principles such as human resource development, enterprise development and local governance, through, for example, the establishment of a co-management structure for the area.</p>
<p>The Khayelitsha wetlands</p>	<p>These wetlands were once seasonal, but have become perennial due to inputs from waste water works. The area should not be used for urban development of any kind. Urban agriculture can be considered in areas between the 1:50 year flood lines and the permanently wet areas, provided fertilisation and irrigation are well controlled to minimise nutrient input into the wetlands (see section on hydrology). The area between the 1 in 2 and 1 in 50 year flood-lines can be incorporated into the planning of open space and could be utilized for a variety of recreational, amenity, and productive land uses.</p> <p>The Kuils River MOSS and the Khayelitsha Wetlands management study recommend that development (physical 'hard' structures) should not take place below the 1 in 50 year floodline and that development levels should be a minimum of 300mm above the floodline. The main flood prone areas</p>

within the wetland area are the informal settlement upstream of Spine Road to the west of the river, the Silvertown area of Khayelitsha, in the 9SAI military base on the northwest banks of the river and the 9SAI sewage works³.

Cattle grazing and small-scale farming

Cattle grazing in the area should ultimately be phased out, but in the meantime strategies should be found to limit grazing to specific controlled areas. The numbers of stock should be limited and stock watering and grazing should be restricted upstream of areas used for contact recreation or the abstraction of water for irrigation of crops due to the risk of bacteriological contamination. In the Khayelitsha wetland area, cattle and goat grazing should be limited to areas of low conservation importance as they cause degradation of the environment and negatively affect water quality. A long term solution that sees a reduction in the number of cattle and possibly their removal altogether must be sought. A study into the carrying capacity of the Khayelitsha wetlands, as well as a cattle count would be required in order to develop a grazing policy. According to the Khayelitsha wetlands management study, if any long term future for the cattle is contemplated, it will have to follow a zero-grazing principle on a 'community kraal' system. The location of such facilities is critical as this activity is not usually compatible with nearby housing and results in considerable pollution.

It should be noted that the water in the wetland is currently unsuitable for irrigation and is marginal for stock watering. Improvement of water quality in the wetland must be an ongoing goal.

There are some key points to note with regard to cattle grazing and small scale farming, irrespective of where they are located: these are noted below

- Cattle and goat grazing should be limited to specific areas (as identified in the Khayelitsha Wetlands Management Study) until such time as it can be phased out.
- Small scale farming (crops) should focus on those adapted to wet conditions when undertaken in close proximity to wetland areas. Indigenous plant crops (such as thatch, reeds and arum lilies) are all adapted to wet conditions. Where crops are further away from wet areas, a greater variety of crops may be used, but steps must be taken to minimise nutrient or pesticide input to nearby wetland areas through use of swales and planted grass barriers or other means. Erosion must be prevented through use of appropriate contouring and soil management techniques. Trenching (permaculture principles) should be encouraged to enrich the soil, rather than the use of artificial fertilizers.

³ Khayelitsha Wetlands Management Study, Final Report. June 1999. Prepared by Ninham Shand, OvP Associates, Sakaza, Chittenden Nicks. Report No 2938/8067

	<p><i>Water quality</i></p> <p>The Khayelitsha Wetlands Management study identifies the wetlands (together with Westbank, Driftsands and Macassar dunes) as an amenity node. Thus there is a need to maximise the fitness for use of the water for at least intermediate contact recreation and reduce nutrients to minimize risk of algal blooms. Stricter standards for and control of sewage effluent as well as improved sanitation and storm water management will be necessary to achieve this goal.</p> <p><i>Areas of high conservation value</i></p> <p>Areas of high conservation value should be protected and managed. The heronry (south eastern portion of wetland) and the limestone fynbos area (west of Baden Powell Drive) (see figures 2.1.1a, b, and c) should be conserved.</p> <p><i>Dunes</i></p> <p>The dunes, although they have been severely disturbed and reduced in extent, should be retained as a buffer around the wetland, whilst smaller dunes which occur within the wetland itself should be preserved. The Khayelitsha wetland would benefit from acacia and water hyacinth removal, whilst some control of <i>Typha</i> might be necessary.</p> <p><i>Cultivation of indigenous plants</i></p> <p>Opportunities to maximise cultivation and harvesting of indigenous plants for craft, medicinal and building purposes should be investigated as these types of plants are adapted to the environment and require very little in the way of inputs. A medicinal garden has been proposed in the area west of Spine Road extension.</p> <p><i>Riparian areas</i></p> <p>Riparian strips should be maintained and no further concrete lining of the river should take place in order to promote nutrient assimilation. Development potential of open spaces in Khayelitsha is shown in Table 7.1 in section 5.</p>
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Determining the need for carrying out Environmental Impact Assessments in the High Control Zone

Any listed activity (in term of the EIA regulations) is likely to require an environmental impact assessment should the proposed development activity fall in the high control zone. This is because developments in this area should be primarily designed around /aimed at biodiversity and open space conservation and sustainable utilisation and anything that deviates from this needs careful evaluation. Should the listed activity be a change in land use from open space or protected area to another activity which clearly supports the

sustainability development which has an emphasis on biodiversity conservation and the retention of corridors, then consideration could be given to reducing the Environmental Assessment process to comprise an Application Checklist or, if necessary, a Scoping Report and an Environmental Management/Control Plan.

MEDIUM CONTROL ZONE

Key Objectives

The key development objectives for this area correspond to those set out in the draft SDF for Khayelitsha and Mitchell's Plain and are as follows:

- The promotion of a decentralised range of opportunities for both higher order facilitators and convenient local facilities in the emerging core area;
- The creation of physical linkages and development that connects Mitchell's Plain and Khayelitsha and which is connected via transport routes such that it is integrated within the City.
- The enhancement of natural environmental assets
- The creation of local level, safe, multifunctional public space which includes the creation of a rationalised, permanent and multifunctional Metropolitan Open Space System (MOSS)
- Development of non-critical land to reduce the amount of poorly functioning open space and improving safety, for example by promoting residential uses on the periphery which are designed to overlook open spaces, thus providing protection from crime.

Objectives that relate more specifically to the environmental constraints present in the area are:

- To ensure that any developments proposed do not compromise the functionality and quality of the Cape Flats aquifer
- To ensure that any developments (including urban agriculture) do not compromise the functioning of the storm water and detention pond system.
- To ensure that any developments do not contribute to the already excessively high air pollution (especially particulates) levels present in Khayelitsha.
- To ensure that natural vleis, pans, wetlands or other seep zones are retained to assist with flood attenuation and water cleansing.

Key areas needing priority attention

1. Areas that are prone to flooding and which are being encroached upon by informal settlements (see hydrology and encroachment maps)
2. Areas where remnant dunes are threatened (particularly if they have resource value and/or biodiversity value)
3. Areas which are being identified as being potentially suitable for urban agriculture
4. Areas which pose particular threats to the health, safety and well being of the surrounding communities

Key areas of potential conflict

The conflict areas mentioned for the High control zone apply here as well. An additional conflict area is the establishment of polluting (or nuisance) small scale 'home industries' within the densely populated residential areas (e.g. chicken farming).

Appropriate land uses and areas of opportunity

There is a wide range of land uses that are appropriate in the medium control zone. Priority areas should be:

- Rationalisation and redevelopment of open space to ensure that the key objectives for this area are met
- Provision of infill housing in suitable areas
- Provision of housing and community facilities in currently undeveloped areas (subject to determination of most appropriate areas)
- Improvement of storm water routes / systems to become less hazardous and ultimately a pleasant open space through park or urban agricultural development (subject to flood plain and storm water management guidelines)

The only development type not suitable to the area is heavy industry that has the potential to pollute air and/or soil/water. Sand mining should also be restricted to areas which have no significant biodiversity or open space (MOSS) value.

Determining the need for EIAs in the Medium control zone

The need for an environmental impact assessment in this area will be very much determined by the type of activity proposed and whether it appears to be in harmony with the development proposals put forward in the SDF and the environmental factors outlined in this EMF. Listed activities are still likely to need an EIA. However, development proposals that are required to proceed through the EIA process due to a change in land use (e.g. from open or undetermined space to residential), but which are in harmony with the SDF principles and spatial proposals and which have taken into account the environmental considerations, could be subjected to a shortened environmental process e.g. an Application Checklist and/or Scoping and/or Environmental Management Plan.

General control guidelines for specific elements of the environment	
Controls and guidelines for development in and around dunes	<p>Set back lines: a minimum of a 100m set back line or inland limit of unvegetated mobile dunes is recommended (whichever is larger). This section comprises of sensitive embryo and foredune habitats. Ecological buffers provide an essential protection between natural systems and development. Abrupt cut-offs between development and dunes can lead to both physical as well as biological erosion of the natural system. In a natural system where there is no development, buffers should be no less than 50m wide. However in a developed situation, buffers should be no less than 25m wide, provided that they are well managed. The buffer should commence from behind the coastal setback line⁴.</p> <p>Limestone Cliff tops should enjoy an inland buffer of no less than 50m.</p>

2.6 Testing Urban Renewal Projects and Programmes against sustainability criteria

Annexure 2 of this report defines sustainability and gives examples of sustainability approaches that have been used in the Western Cape. To assist in assessing the sustainability of urban renewal projects, a series of key questions can be asked, as noted below.

Key questions that form part of the EMF are divided into several thematic areas as follows:

1. Alignment with national, provincial and local sustainable development approaches
2. Biodiversity and natural resource management
3. Sustainable human settlements
4. Sustainable management of energy, water and waste

2.6.1 Alignment with national, provincial and local sustainable development approaches

In the light of national and provincial sustainability approaches, as well as the URSDF strategic direction for Khayelitsha and Mitchell's Plain, any URP project should be justifiable against the set of questions outlined below:

Is this project/program/plan:

⁴ Low and Pond (2001) cited in CCT (2004:19)

1. In line with the elements of the *Ikapa Elihlumayo* strategy, the Provincial Growth and Development Framework (PGDF) and the Western Cape Provincial Spatial Development Framework?
2. Supported by bioregional planning for that area?
3. Supported by the elements of the Western Province Coastal Management Policy and Programme?
4. Supported by the Integrated Energy Strategy and Programme for the Western Cape and the City's Energy and Climate Change Strategy.
5. Aligned with the Western Province Sustainable Development Implementation Plan?
6. Able to be measured using the Quality of Life Index and/or have other indicators which provide feedback regarding whether progress is being made towards sustainable development?
7. In line with the 2020 Integrated Metropolitan Environmental Policy vision?

2.6.2 Support biodiversity and natural resource management

Does this project/program/plan:

- Explicitly recognise and/or realise the value of biodiversity and ecosystems?
- Articulate and mediate the trade-offs between economic growth, biodiversity and human well being?
- Link strategic level and project level environmental assessment (such that cumulative impacts on ecosystem services are taken into account)?
- Prepare for climate change by optimising sustainable use of natural vegetation and alternative crops to maximise production whilst minimising land take, water use, fertilisers etc., to meet the challenges of predicted climate change?
- Safeguard the rights to the Western Cape's genetic resources?

2.6.3 Support sustainable human settlements

Does this project/program/plan:

- Improve the quality of life for all those affected (i.e. are people made better off by this through increased social justice and more equal access to natural resources)?
- Generate jobs and help reduce poverty?
- Have mechanisms in place to ensure that all the people likely to be affected by this project are able to participate during the planning process?
- Demonstrate sufficient financial resources for this project (or have other funding possibilities been assured)?
- Identify other organisations that can provide support for this project?
- Identify a person who will be able to follow this project through to its successful completion (accountability and good governance)?
- Involve communities in the resolution of their own problems rather than creating dependencies on a state committed to delivery?

- Facilitate socially mixed communities taking into account differences in language, lifestyle, incomes and the threat of middle class buyouts of subsidised housing units?
- Help municipalities to understand sustainable resource use, with special reference to energy, waste, water and construction?
- Support innovation and sustainable building methods (See Box 3 in Annexure 2).

Box 2.6.3.2: Integrating sustainable development into the built environment

Environmental Sustainability

- Site: Minimize damage to sensitive landscapes (such as dunes/wetlands)
Minimize building footprint
Conserve and regenerate natural areas to provide habitat and promote biodiversity
- Water: Reduce the use of potable water through efficient fittings, wastewater reuse
Adopt innovative wastewater technologies
- Energy: Design for passive heating cooling and ventilation
Optimize the thermal performance of the building envelope
Use efficient equipment and lighting
Use renewable energy technology
Reduce transport energy (accommodate cyclists, pedestrians)
- Materials: Specify materials that meet a range of sustainability criteria – renewable resources, recycled content, low embodied energy, non-toxic, pollution in manufacture, fossil fuel and mineral consumption
- Waste: Divert construction waste from landfill
Provide an operational waste facility for recycling at source

Social Sustainability

- Healthy indoor environments: Physical health (paints that reduce emissions, formaldehyde, VOCs)
Psychological health (adequate daylighting)
- Safety: Design of the building and on the construction site
- Inclusive environments: Access for the disabled
Participation and control by the user (consultative design process, opening windows)
- Education: Sustainability strategies made visible to users
Skills training of construction workers (environmental induction)
- Open Space: creation of dignified public open space that supports a range of social, economic and cultural activities

Economic sustainability

- Support the local economy: Suppliers, contractors, labour
- Adaptability and flexibility: Design for adaptability for different users
Services configuration allows different arrangements
- Lifecycle costing (includes capital cost + ongoing cost)
- Efficiency of use (proportion of useable to non-useable space)
- Buildability (ease of construction, design relates to component sizes, reduce material use)
- Ongoing costs (maintenance, energy, water)

2.6.4 Support sustainable management of energy, water and waste

Does this project/program/plan:

- Cooperate with the rapidly expanding number of recyclers in the private and NGO sector in order to develop implementable plans for dealing with the solid waste management challenge in a way that creates new permanent jobs and recycles wastes for re-use (for example, as in Curitiba, Brazil, the glass components of street lights are made from recycled bottles)?
- Develop action plans for radically reducing water consumption and increasing efficiencies whilst recognising the impact of HIV/Aids and other illnesses on the minimum volume of affordable water needed by poor households?
- Harness the value of wetlands and rivers through optimising their ecological and social functions (e.g. purifying water, storing floodwaters, and providing scenic amenities and recreational areas for the community – See Case Study 2, Annexure 2)?
- Ensure that nature and/or existing services are able to meet the demands of the proposal (especially waste management and pollution control)?
- Ensure that damage to the natural or cultural environment is avoided or limited to as little as possible (e.g. the principles of no net loss of natural resources apply)?
- Move away from fossil fuels as the foundation for all energy supply, incorporating, for example, passive thermal design and insulation mechanisms such as the installation of ceilings (See Case Study 1, Annexure 2)?
- Develop a greater focus on energy efficiency, particularly through simple and cost effective mechanisms such as solar water heating systems?

The key questions outlined in the four thematic areas above collectively provide guidance on the degree to which the development proposal/application moves the local area, and hence the province and nation, forward along the path towards sustainability. Although it need not be mandatory for the development application to respond to all the key questions posed in this chapter, it is possible that, should a development application document its “worthiness”, in terms of contributing towards the South African sustainable development agenda, it may be fast-tracked through the administrative process. Applications which actively demonstrate sustainable development, AND are located favourably in terms of the control zones outlined in the EMF, can move more rapidly through the environmental authorisations administrative process.

2.7 Using the EMF

The forthcoming revised environmental assessment regulations in terms of NEMA will influence how the EMF is used. Irrespective of this legislation, it is possible to utilise the EMF as a planning and decision making tool as it contains information that should influence the conceptualisation, design and location of urban renewal projects. The EMF can assist by:

- supplying information that can be used in the application checklist (screening) process

- providing baseline information on the environmental conditions in Khayelitsha and Mitchell's Plain
- assisting with identification of issues to be addressed in the scoping and investigative components of EIA processes
- assisting with identification of project alternatives and the assessment of scenarios
- assisting with determination of the significance of impacts associated with projects or programmes
- assisting with identification of potential preventative or mitigatory measures to address potential impacts
- identifying opportunities to enhance the improvement of the socio-economic situation
- identifying opportunities to maximise sustainable utilisation of the remaining open spaces and biodiversity resources.

Together with the SDF, the EMF should assist in improving the planning and development processes in Khayelitsha and Mitchell's Plain.

3. CONCLUSION

The Environmental Management Framework has provided the baseline information necessary to assist potential developers to take environmental factors into account in the conceptualisation, design and construction of developments in the Khayelitsha / Mitchell's Plain urban renewal area. It also serves to alert decision making authorities to key questions and environmental considerations that need to be taken into account when evaluating development proposals. A document of this nature can however, only provide information at a local, but not site specific level. Proponents will therefore need to refer to the information sources utilised for this EMF for further details (see references), or in some cases, may need to commission specific studies to address particular information requirements.

The EMF identifies conservation and environmental priorities, specific areas and aspects that need to be managed and key factors that need to be taken into account in the compilation of spatial plans and IDPs. It also identifies potential areas of opportunity and conflict. Cross reference is made to the draft SDF for Khayelitsha and Mitchell's Plain wherever relevant.

One of the purposes of an EMF is to identify means by which the environmental assessment process can be facilitated, and if possible, shortened. In summary, the EMF is able to shorten the environmental assessment process if

- a) the listed activity involves a change of land use to a land use type and location supported by the SDF and
- b) takes into account the various environmental constraints and opportunities presented in the EMF.

PART 2

SITUATION ASSESSMENT

The following sections provide the information necessary for compilation of the EMF. It provides baseline information on five strategic issues which need to be taken into account in planning for, evaluating, implementing and managing developments in the Khayelitsha / Mitchell's Plain urban renewal area. The strategic issues were identified through literature review, examination of the aerial photographs of the area and consultation of people (e.g. planners) who work in and are familiar with the area. The five key issues are:

- Section 3: Use and management of dunes and dune remnants (A)
- Section 4: Hydrology, storm water and flooding (B)
- Section 5: Enhancement of open space systems and resources (C)
- Section 6: Air and water quality (D)
- Section 7: Historical and cultural and heritage resources (E)

SECTION THREE
STRATEGIC ISSUE: USE AND
MANAGEMENT OF DUNES AND DUNE
REMNANTS

3. SECTION THREE

STRATEGIC ISSUE: USE AND MANAGEMENT OF DUNES AND DUNE REMNANTS

1. INTRODUCTION

This section provides an overview of the main dune systems in Khayelitsha and Mitchell's Plain. It also provides guidelines, recommendations and preconditions for development so as to resolve potential and existing conflicts between urbanization, recreation and conservation, in and around coastal and remnant dune areas in Khayelitsha and Mitchell's Plain.

This section may also be used to streamline and focus future projects related to dune management in the study area.

The description below focuses first on the biophysical and biodiversity attributes of the dunes. This is followed by a description of their socio-economic context. The management implications are then noted.

Please refer to the dune sensitivity map (map 2).

Dunes have been an important landscape feature throughout the planning history of the Cape Flats. The Cape Flats is a flat and low-lying area with harsh environmental conditions for human occupation, especially during the rainy winter season. The area was identified in the 1970's for the establishment of residential areas and dormitories to provide housing for Coloured and African people living in Cape Town. A large portion of the Cape Flats dune system was flattened in an attempt to improve its suitability for the construction of residential units. It was during this period that the inland and coastal dune systems that have formed along the False Bay coastline were severed. Over the years, rapid population growth and urbanization on the Cape Flats has further reduced the size and extent of inland and coastal dune systems in order to accommodate the flow of people into rapidly expanding areas such as Khayelitsha. Sand mining has also resulted in the renewal of dunes.

Residents of Khayelitsha and Mitchell's Plain have differing perceptions of the remaining dunes. Some see the remaining coastal and inland dune remnants as natural assets⁵ but there are also those who perceive them as security threats as well as features that prevent urban development. Others see them as potentially lucrative sources of building sand.

⁵ Personal comments from MPDF (2005)

Statement of strategic issue: Dunes play a significant role in the biophysical and socio economic environments of Khayelitsha and Mitchell’s Plain. They act as areas of both opportunity and conflict. The conservation and socio economic roles of dune remnants in Khayelitsha and Mitchell’s Plain need to be established in order to improve the management of dune areas and to improve the interface of dune areas with the surrounding land uses. With approximately 20km of coastline falling within the study area, opportunities to maximize the educational, recreational and conservation use of the coastline needs to be assessed in greater detail.

2. DESCRIPTION OF THE BIOPHYSICAL CHARACTERISTICS OF DUNE SYSTEMS

2.1 Coastal Dune systems found in Khayelitsha and Mitchell’s Plain

As seen in Table 2.1.1, seven coastal dune systems for the study area have been identified and include, Kuils River, Macassar, Monwabisi, Mnandi, Wolfgat and Strandfontein. The Cape Flats dune system is the most extensive dune system of the seven and extends far inland into Khayelitsha and Mitchell’s Plain.

Table 2.1.1: Main dune systems in Khayelitsha and Mitchell’s Plain area⁶

Dune system type	Dune type	System type
False Bay – Kuilsriver	Embryo dunes	Embryonic
False Bay - Macassar	Embryo dunes	Embryonic
False Bay – Mnandi	Embryo dunes	Embryonic
False Bay – Monwabisi	Dune sand over limestone	Regressive inland
False Bay – Strandfontein	Embryo dunes	Embryonic
False bay - Wolfgat	Embryo dunes	Embryonic
Cape Flats	Parabolic dune field	Regressive inland ⁷

⁶ CCT (2004) Adapted and summarised from attribute table of GIS theme on dune remnants in CCT

⁷ Regressive inland: A shrinking dune system as a result of urbanisation, and/or where sand movement is arrested⁷.

Box 2.1.1: Description of dune types*Embryonic dune*

A basic “pioneering” dune system, usually along the coastline and just above the high water mark⁸. The earliest stage of dune formation, occurring as small mounds to low hummocks at the coast, often colonized or initiated by isolated plants.⁹

Parabolic dune

A tongue of advancing sand with a rounded nose that migrates with the direction of the wind. Parabolics also produce two trailing edges (the two ‘legs’ of ‘hairpin parabolics’). They can be unvegetated but are generally stabilized by vegetation on dune sides.¹⁰

Dune sand overlying bedrock: sandstone, limestone, granite

Undifferentiated dunes which lack any structure but cover bedrock.

2.2 Inland dune systems in Khayelitsha and Mitchell’s Plain

The inland dune remnants of Swartklip and Driftsands are most frequently mentioned in the literature reviewed. Other dune remnants are found in areas zoned as public open space, rural or undetermined, in areas such as Rocklands, Westridge and Eastridge within Mitchells Plain¹¹. Information available on inland dune remnants is very limited and in some instances, is non-existent.

A detailed assessment of the remnant dunes needs to be undertaken, especially in Mitchell’s Plain, where some of the dunes are seen to be hazardous to the socio-economic welfare of the neighbouring community in that they are used as a hideout and escape route for criminals.

2.3 Vegetation of coastal dune remnants

According to CMA (1999) the terrestrial vegetation on the Cape Flats is comprised of three broad communities, namely dune thicket (Strandveld), dune fynbos and limestone¹². The dune thicket vegetation, is typically shrubby vegetation found on the dunes throughout the Cape Flats¹³. Dune fynbos occurs in small patches within the dune thicket and is often associated with seasonally moist sites in hollow dunes¹⁴. The limestone fynbos community contains a unique type of flora on the Cape Flats and is restricted only to dune areas that have formed over limestone bedrock¹⁵.

⁸ Adapted from CCT (2004:11)

⁹ Low and Pond, 2004

¹⁰ Low and Pond, 2004

¹¹ Observation from 2004 aerial photographs for Khayelitsha and Mitchells Plain

¹² CMA (1999:18) Khayelitsha wetland management strategy

¹³ CMA (1999:18) Khayelitsha wetland management strategy

¹⁴ CMA (1999:19) Khayelitsha wetland management strategy

¹⁵ CMA (1999:18) Khayelitsha wetland management strategy

3. THE ROLE AND VALUE OF DUNES

3.1 Conservation/Biodiversity value of dunes

The City of Cape Town have been undertaking significant work to identify core conservation areas which together make up a biodiversity network. A summary of the main initiatives in this regard is given in section 5 of this report.

The Botanical Society of South Africa has identified core conservation areas to conserve the Cape Flats flora species. They have been identified so that appropriate planning for conservation can be considered along with other demands for the area. It has been established that 26 sites would be required as a minimum to conserve the Cape flora species and the endemic species of the Cape lowlands. Of those, 15 sites were recommended for CORE¹⁶ status. Some have been given some core status whilst others should still be given some formal conservation status. Three of the core sites identified fall within the study area for this report. They include one local authority reserve (Wolfgat nature reserve), and two sites which still require official protection status, Macassar Dunes and Swartklip¹⁷. A nearby site, the Driftsands Nature Reserve, is also a core site.

A summary table for the core conservation sites (as identified by the Botanical Society) has been included below and listed horizontally according to their importance.

Table 3.1.1: Core conservation sites as identified by the Botanical Society¹⁸

	Macassar Dunes	Wolfgat Nature Reserve	Swartklip	Driftsands (outside study area)
All species	253	160	107	105
Cape species	76	63	23	34
Cape flats species	2	3	1	0
Cape flats endemics	2	1	1	1
RDB Species	5	4	2	2

¹⁶ Core botanical sites do not have statutory conservation status unless they fall within protected areas.

¹⁷ McKenzie and Rebelo (1997:6)

¹⁸ Adapted from McKenzie and Rebelo (1997:6)

Site specific species	32	0	13	4
Area of site		268 ha		
Conservation Status	<i>No formal conservation protection proposed local authority nature reserve</i>	<i>Proclaimed nature reserve</i>	<i>No formal conservation status</i>	<i>Proclaimed nature reserve</i>

The information from the core conservation area study has also been utilized in establishing a city-wide Biodiversity Network which is aimed at protecting and enhancing a minimum set of the unique biodiversity of Cape Town. The Biodiversity Network (see section 5 of this report) identifies network conservation priority areas which are divided into three categories (A, B and C). Each of these categories is described in terms of the functions of its component parts (nodes and corridors¹⁹) and specifies the appropriate kinds of development permissible within each category. Two key nodes (of nine) identified in the Biodiversity Network that fall into and adjacent to the study area are the Wolfgat/Macassar Dunes node and the Driftsands/Khayelitsha node.²⁰ The permissible land uses within each of the A, B and C category areas are:

1. Category A areas: should be used exclusively for biodiversity conservation purposes;
2. Category B areas: should be used primarily for biodiversity conservation purposes but can also accommodate other compatible land uses, and
3. Category C areas should also be used for biodiversity conservation purposes, but this will not be their primary use.

Map 4 shows that the key biodiversity conservation areas within the study area (i.e. those that receive a category A biodiversity classification) are the Wolfgat Nature reserve dunes, the Swartklip inland dunes and the Macassar dunes. An adjacent area (immediately outside study area) that receives the A categorization is the Driftsands nature reserve and a series of dune remnants that extend into the study area from the adjacent Phillipi area. Included in this area is the Dagbreek dune which receives a category A rating. In addition to its biodiversity value, the dune has socio-economic value in that it is being used for ecotourism and education purposes by members of the local community. Category C dunes are found in the coastal Swartklip dunes (north east of the Wolfgat Nature Reserve).

Dunes are recognized in the Biodiversity Network as having both intrinsic in situ

¹⁹ A 'node' is an area with a concentration of biodiversity features or an area of attraction of features that enable the maintenance of biodiversity pattern and process, while 'corridors' maintain flows or fluxes between these areas of concentration/attraction.

²⁰ City of Cape Town. Biodiversity Network Prioritisation Project. Draft 2.1 Final Report. June 2004. Compiled by Marlene Laros & Associates – Sustainability Matters.

biodiversity value, as well as playing an important role as corridors. The need to maintain a corridor linkage between the Monwabisi, Swartklip and Macassar dunes has been identified.

Low and Ponds (2004:18) recommend that protection linkages between the Wolfgat and Macassar Dune system are essential, and that the creation of a nature reserve at Macassar Dunes should receive priority.

The Mitchell's Plain: Local Area Spatial Development Framework (2000), suggests the consolidation of the ecologically significant areas of False Bay Coastal Park, Wolfgat nature reserve, botanically significant sites at Swartklip and the Kuils River estuary as core conservation areas. The guidelines also suggest the preservation of the coastal strip between the coast and Mitchell's Plain and Strandfontein for conservation and coastal recreation only. This proposal will enhance the conservation value of Wolfgat Nature Reserve²¹.

3.2 Role of dunes in storm water control and aquifer recharge

The role of the Cape Flats dunes in aquifer recharge has not been measured, however, the sand is highly permeable and it is likely that the dune areas act as recharge areas for the aquifer. The dunes can also assist in storm water control if they are taken into account in the design and operation of storm water systems.

3.3 The socio-economic context of dunes

Dunes play a significant role within the socio-economic environment within which they are located. They lend interest to the environment in aesthetic terms and also are used for a wide variety of purposes. The landscape and archaeological value of the dunes are briefly discussed first, followed by a description of uses of the dunes and particular management challenges.

3.3.1 Landscape value of the dunes

Within the boundaries of the Wolfgat reserve is an undulating (south east/north east) sand dune that reaches up to a height of nearly 60m above mean sea level²². In addition to this, there is an interesting history of landscape or geological features (such as cliffs) that date back to 18 000- 16 000 years ago (Holocene period). During this time the sea level began to rise and started eroding the coast northwards from the mouth of False

²¹ CCT (2001:19) Wolfgat nature reserve, draft EMP

²² CCT (2001:8) Wolfgat nature reserve, draft EMP

Bay. Unique cliffs began to form as a result of the shearing force of the water. These cliffs can be seen at Wolfgat. The northern remnant is best seen in the south east corner of the Cape Flats²³. The limestone cliffs found on the False Bay coastline at Wolfgat are recognized for their distinct uniqueness, which has made them a rare landscape feature worthy of protection.

The Macassar dunes contain the tallest and most extensive remaining parabolic dunes on the Cape Flats.²⁴ They offer exceptional views of the nearby Helderberg, Hottentots Holland and Kogelberg mountains and the Cape Peninsula. Prior to the development of Khayelitsha the length of the dune was 8km. With urbanization the length of the dune has been significantly reduced and most of the last of this remnant dune system can be found between Baden Powell drive in the west and the Eerste River estuary in the east²⁵. The dune system has created a major physiographic corridor between the sea and the areas closer to Macassar Road. Its width varies between 3km along Baden Powell drive and 1.5km between Sheik Joseph's tomb and the coast²⁶. In spite of ongoing urbanization, the Macassar Dune system is still recognized as a significant feature of the Cape Flats landscape and can be seen from over 20km away²⁷.

Two other remnant dunes which are of particular interest in terms of their effect on the landscape are the Lookout Hill dune, which gives panoramic views over Khayelitsha and the peninsula and the Rocklands and Dagbreek dunes which give views over Mitchell's Plain. The dunes break the flat monotony of the Cape Flats and if well managed, provide opportunities for both ecotourism and environmental education. However, when the dunes are not integrated into the urban fabric, they can become a security problem, as noted in the following sections.

3.3.2 Archaeological importance

Along the Wolfgat coast there is evidence of Strandloper activity (middens), as well as fossil remains of locally extinct animals including the brown hyaena (wolf). The name is derived from a fossilized brown hyaena den (wolf=hyaena, gat=den), which was found along the coastline cliffs in 1962. Brown hyaena inhabited the shores of False Bay up until the 1840s. The fossil dens date back some 45 000 years, but have now collapsed as a result of natural erosion and vandalism²⁸. (For further information see section [insert](#) on sites of cultural importance).

Very little archaeological exploration has taken place along the coastline by academic departments of UCT or the SA Museum. The likelihood of middens or other

²³ CCT (2001:9) Wolfgat nature reserve, draft EMP

²⁴ CMC (2000:ch 3.2) Macassar Dunes Management Plan

²⁵ CMC (2000:ch 3.2) Macassar Dunes Management Plan

²⁶ CMC (2000:ch 3.10) Macassar Dunes Management Plan

²⁷ CMC (2000:ch 3.10) Macassar Dunes Management Plan

²⁸ CCT (1996:3) Discovering Wolfgat nature reserve

archaeological / palaeontological remains is high. Archaeological investigations should thus be part of any studies related to development proposals.

3.3.3 Use of dune resources by residents of Khayelitsha and Mitchell's Plain

The use of dunes in Khayelitsha and Mitchells Plain is divided into formal uses and informal uses. This is followed by the desirability of the use in the context of the area.

Table 3.3.3.1: Formal and informal use of dune areas

FORMAL USE OF DUNE AREAS
<p>(a) User group: Recreational users</p> <p><i>Use 1: Fishing</i></p> <p>Cliff tops are excellent fishing sites</p> <p>Some dune areas used for this purpose: Wolfgat</p> <p><i>Use 2: General recreation including picnicking, leisure walks, bird watching, swimming etc</i></p> <p>Some dune areas used for this purpose: Mowabisi, Wolfgat, Macassar, Mnandi, Strandfontein, Dagbreek, Rocklands</p>
INFORMAL USE OF DUNE AREAS
<p>(a) User Group: Traditional healers and Rastafarians</p> <p><i>Use 1: Harvesting botanical resources</i></p> <p>Some plants of medicinal value grow in nature reserves and open spaces close to Khayelitsha and Mitchell's Plain. These species are harvested and used by traditional healers and Rastafarians to treat patients using traditional healing techniques. No information exists regarding the type of species, amount and frequency with which they are harvested from these natural dune areas (see cultural and heritage assessment section 3.4).</p> <p>Some dune areas used for this purpose: Wolfgat, Macassar Dunes area, Monwabisi River</p> <p><i>Use 2: Initiation sites:</i></p> <p>Natural dune areas and open spaces isolated from residential areas and other land uses are used to perform initiation ceremonies. Peripheral dune areas are used by initiates because they are isolated from people and offer a wilderness experience (see cultural and heritage assessment section 3.4).</p> <p>Some dune areas used for this purpose: Swartklip, Monwabisi</p>
<p>(b) User group: Wood cutters</p> <p><i>Use 1: Wood is harvested and used as a source of fuel by residents in Khayelitsha and Mitchell's Plain. The literature available indicates that wood from alien trees is harvested,</i></p>

<p>however this might not be the case in all dune areas.</p> <p>Some dune areas used for this purpose: Macassar, Wolfgat</p>
<p>(c) User group: Hunting</p> <p><i>Use 1:</i> Illegal hunting of buck, birds and other wild animals</p> <p>Some areas used for this purpose: Macassar/Swartklip. Also takes place in other large natural open spaces.</p>
<p>(d) User group: Off road vehicles</p> <p>The use of ORV is considered as an undesirable activity and is illegal on beaches / coastal zone.</p> <p>Some dune areas used for this purpose: Macassar, and may include other inland dune areas.</p>
<p>(e) User group: illegal dumping</p> <p><i>Use 1:</i> Illegal dumping sites</p> <p>The urban edge between Mitchell's Plain (as well as Khayelitsha) and Wolfgat, Monwabisi and Macassar is poorly defined giving rise to illegal dumping.</p> <p>Some dune areas used for this purpose: Wolfgat, and possibly other inland dune areas</p> <p><i>Use 2:</i> Criminal activity</p> <p>Some dune areas used for this purpose: Wolfgat, Monwabisi, Macassar</p>
<p>(f) User group: Cattle keepers</p> <p><i>Use 1: Grazing</i></p> <p>Dune areas are often used by cattle keepers as grazing areas.</p> <p>Some dune areas used for this purpose: Macassar, Monwabisi and possibly other inland dune areas</p>

Table 3.3.3.2: Use of dune areas for cultural and religious activities

Khayelitsha	Mitchells Plain
Initiation Schools. Male circumcision schools	Political Gatherings
Harvesting of medicinal plants	Harvesting of medicinal plants
Cattle grazing	
Hunting	
Church gatherings	

3.4 Problems and conflicts in dune areas

Remnant dune systems exist inland of Khayelitsha and Mitchell's Plain but outside the parameters of the coastline. Some inland dune systems share a close interface with

residential areas and have led to conflict in areas such as Mitchell’s Plain. A typical example is illustrated below in Picture 1.



Picture 1: A typical example of the close interface between residential areas and some inland dunes in Mitchell’s Plain. The orientation of the homes along the dune area, does not allow for residents to monitor activities within the dune area.

(a) Areas of conflict (Case example: Eastridge and Westridge)

Dunes found within Mitchell’s Plain share a close interface with residential areas and are a source of both conflict (and synergy) between neighbourhoods. As seen in Picture 2 an informal pathway has been created across a dune in order to access community facilities such as schools, clinics and to make social visits to residents in the neighbouring area. This dune remnant is situated between the Eastridge and Westridge communities.



Picture 2: Inland dune remnant found between the East Ridge and West Ridge communities in Mitchell’s Plain.

Residents argue that the re-opening of the pathway has led to an increase in loitering and vandalism and has resulted in an upsurge of crime in the area. Homeowners alongside the dune feel that the height of the dune has made it difficult for houses

alongside the dune to oversee and monitor activities in the dune area. Criminals utilize the area as a shelter and escape route. Furthermore, homeowners alongside the dune are unable to monitor users of the pathway since the back-end of their homes faces the dunes. Some residents have lobbied strongly for the dunes to be bulldozed and replaced by a road or formal pathway to improve access to educational centers. A typical example of the orientation of the house in relation to the dunes is illustrated in picture 2.

The improper interface between dune systems and residential areas has led to similar conflict in areas around Mitchell's Plain. Dune areas have been stigmatized because of their association with crime and other antisocial activities in Mitchell's Plain. However there are some dunes which are viewed in a positive light by the community and are being used actively as a resource (e.g. Dagbreek dune where local people are involved in showing tourists the dunes).

(b) Gangsterism (Tafelsig)

A similar situation persists in residential areas close to large expansive open spaces or protected areas and nature reserves. The north-east section of Wolfgat can be reached in the Tafelsig area of Mitchell's Plain. This is the back-end of the nature reserve and it has not been properly fenced off. Due to the absence of a fence or formal entrance point, gangsters in the area are able to freely access this portion of the nature reserve and use it as an informal burial ground for their victims, as a place of shelter when engaging in criminal activity and have transformed it into a breeding ground for activities associated with gangsterism.

(c) Encroachment of informal settlements on dunes

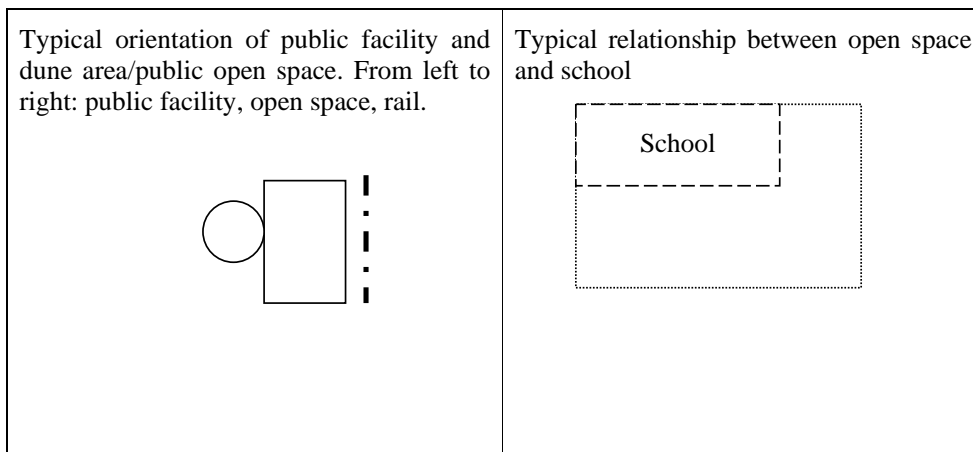
The encroachment of informal settlements onto dunes areas especially those that have conservation importance is a problem in both Khayelitsha and Mitchells Plain. The coastal dunes and some of the larger inland remnant dunes have been affected (see map 6 which shows areas of encroachment). Most of the new informal settlements have emerged along Baden Powell drive and areas along the False Bay coastline that have been noted for their botanical diversity. Areas affected by informal settlement encroachment include Monwabisi Park, Swartklip, the northern portion of Macassar dunes and Rocklands.



Picture 3: This picture is a typical example of informal settlements constructed on dune areas. Existing and new informal settlements are being constructed on dune areas within the bounds of large peripheral open spaces. Continued encroachment into peripheral sites threatens the botanical diversity of the dunes.

(d) Dune interface with educational centers and public facilities

Dune areas or large expansive open spaces close to schools are generally fenced off and are not utilized by the school. Access is not easy and the educational value of natural systems has not been fully realized due to security issues [refer also to the Urban Renewal Spatial Development Framework for Khayelitsha / Mitchell's Plain (URSDF)].



e) Windblown sand

The strong south easterly wind is characteristic of areas south east of the CMA. Picture 4 shows the strong force of the wind carrying sand (from an exposed dune) across the road. Windblown sand can impair the vision of both pedestrians and drivers and is therefore a nuisance and threat to road safety in Khayelitsha and Mitchell's Plain. Roads along the coastline and close to dune systems incur additional maintenance costs to clear the sand, (for example Baden Powell Drive). The sewerage pumping station, the service road and the Monwabisi resort access road are located

within a wind-blown sediment pathway. In dry summer months sand deposited on the beach is blown off the beach and towards the north-west by the south easterly winds²⁹. The transport rate of sand shows that the exposed dunes of up to 4m high can move at a rate of between 15 and 40m per year towards the north-west under prevailing wind conditions.



Picture 4: Wind blown sand

f) Off-road vehicles

Off road vehicles (ORVs) tend to have localized but severe impacts on dune systems, particularly those that are vegetated. This results in stable dunes becoming unnaturally mobile.

g) Visual impact

The Visual and aesthetic qualities of the Macassar dunes has already been impaired by a row of electricity lines that run in a line near the top of the seaward side of the high dune. A few houses on the northern aspects, above Eerste River, have also compromised the aesthetics of the site³⁰. The implications are that maximum contour heights for development need to be determined in these areas.

h) Fire

Vegetation in the fynbos biome has evolved with natural disturbances like fire. Vegetation which has not been sufficiently burned for many years becomes senescent (build up of dead material) and prone to uncontrolled wild fires which can become a danger to surrounding urban areas. In Khayelitsha and Mitchell's plain, fire on dune areas has not been a significant problem. Fires are however a major problem within the informal settlement areas. Those dunes that are covered in invasive species such as *Rooikrans* will contribute to risks of uncontrolled fire.

i) Agriculture

Agriculture has only a localized impact on dunes, due to the poor nature of calcareous

²⁹ City of Tygerberg (1999) EMF for Monwabisi

³⁰ CMC (2000:ch 3.9)

sands³¹. Excessive use of the dunes for grazing could cause erosion but at present the preferred areas for grazing are in the flatter areas of Khayelitsha and Mitchell's Plain.

j) Alien infestation

Woody alien plant species, most notably *Acacia cyclops* (Rooikrans) and *Acacia saligna* (Port Jackson) infestation produces one of the biggest impacts due to its wide distribution, high invasive potential and ability to repress and exclude natural vegetation³². Alien plants have to be controlled by alien eradication programs.

k) Sand mining

The sand deposits in the greater Cape Town area are subdivided into 12 subareas according to their geographical distribution and, to a lesser extent, their genesis. Three of these areas fall near or partly within the Khayelitsha/Mitchell's Plain area. They are Phillipi (western border of Mitchell's Plain), Macassar (east of Khayelitsha) and Kuils river (also east of Khayelitsha). Phillipi is the traditional sand mining area of Cape Town. Most of the sand occurs in partly vegetated north – northwest trending hairpin parabolic dunes (Witzand Formation) that are up to 3 km long, 0,7 km wide and 40 m high³³. The sand is used for fill, mortar and to a lesser extent, plaster and concrete. Building sand is also found within the Wolfgat Nature Reserve and along the Strandfontein coastline. The Council for Geoscience has assessed the potential for building sand in the greater Cape Town area. Although the areas identified as having the most potential for sand mining lie outside the study area, it is likely that most of the sand dunes in the Khayelitsha and Mitchell's Plain areas represent a potential sand resource. The area has not been significantly studied for its sand potential as it was regarded as having been largely 'sterilized' by urban development.

There is one formal sand mine on the south east corner of the Swartklip site. It has a licence until 2008 but has largely been mined out³⁴. The intention was to use the site for housing but mining has taken place into the water table which limits land use options. Mining has stopped and court actions are proceeding. There are also several 'illegal' sand mines (see map 1b), notably one north of Highlands drive and east of Weltevreden drive. Illegal sand mining has also taken place in the Monwabisi dunes (south eastern corner of Khayelitsha), south west of the formal sand mining area in the Macassar dunes. There is ongoing pressure to mine these dunes. Smaller amounts of sand are regularly removed illegally from remnant dunes in the area. This poses a danger for the neighbouring communities' children who are tempted to play in the dune areas and are vulnerable to suffocation from unstable collapsing dune faces. This activity also undermines the potential to derive other benefits from the remaining dunes.

³¹ CCT (2004:14) Low and Pond

³² CCT (2004:14) Low and Pond

³³ D.I. Cole and J H A Viljoen, Building sand potential of the greater Cape Town Area. Council for Geoscience Bulletin 129. 2001

³⁴ Pers comm.: Mr J Briers, Department of Minerals and Energy

However, building and mortar sand are a key resource and should not be wasted. The environmental management section of the report thus indicates that should there be a dune or sand area of 3m height or more, that is going to be removed in order to allow development, then this sand should be constructively used and not effectively 'sterilized' by just being flattened and pushed over the construction site. Any sand that falls within a coastal high control zone, should not be mined.

3.5 Opportunities presented by dune systems

Dune systems present a wide variety of opportunities, including:

(a) Social opportunities

Dunes provide open space area and green belts close to the Mitchell's Plain and Khayelitsha communities, and have the potential to provide for these communities recreational and educational needs³⁵.

b) Educational and recreational opportunities

The Wolfgat coastline cliffs are valued for walking and fishing. An environmental education centre is proposed near the boundary of the reserve. A further example is the Dagbreek dune where local schools are involved in litter control and ecotourism initiatives.

c) Conservation opportunities

The biodiversity conservation of some dunes has been recognized. Wolfgat in particular has the only mainland-breeding colony of kelp gulls in the southwestern cape. There is also rich marine life on rocky shores. There are diverse vegetation communities on the cliffs, dune and inland sands, comprising Sandveld vegetation, of which only 32% of its former range remains in the Greater Cape Town lowlands³⁶.

d) Sand mining

Although sand mining is a destructive activity, if it has been determined that a dune area has to be removed for a development, then the sand should be constructively used in the building industry. Sand mining requires strict control as there are many impacts associated with the mining process. These include destruction of habitat, wind blown sand, nuisance impacts e.g. noise, and visual impact.

4. ALLOCATION OF SENSITIVITY RATINGS TO THE DUNE SYSTEMS

This section should be read in conjunction with Map 2 (dune sensitivity).

³⁵ CCT (1996:2) discovering Wolfgat nature reserve

³⁶ CCT (1996:1) discovering Wolfgat nature reserve

The dunes have been allocated sensitivity ratings. The explanation behind these allocations are noted below.

Embryo dune systems

These dune systems are in the most dynamic stage of the dune formation process and are often non-vegetated or partially vegetated³⁷. Embryo dunes are generally described as pioneer dune systems. If embryo dunes are disturbed, further dune formation processes may be halted. There could also be impacts on related coastal processes, such as beach nourishment. From a management perspective embryo dunes should strictly be enforced as ‘no-go’ or highly sensitive areas³⁸. Any developments or activities that are likely to affect embryo dunes must therefore be subject to an environmental assessment process.

Box 4.1: Management implications for embryo dunes within study area

The Kuils River system, Macassar, Mnandi, Strandfontein and Wolfgat are all partially vegetated embryo dunes, in their initial stages of dune formation. Embryonic dunes are known to form just above the high water mark and dunes within this zone should be treated as high sensitivity zones in order to maintain coastal processes and minimize unwanted impacts and management costs along the False Bay coastline.

Parabolic dune systems

The second dune system is made up of parabolic dune fields, and consist of ‘advancing sand migrating with the direction of the wind’³⁹. These systems are found inland and are usually vegetated⁴⁰. The Cape Flats system is the largest dune system and covers a large part of Khayelitsha and Mitchell’s Plain. A parabolic dune field is a system where sand is moving in the prevailing wind direction and has been actively regressing (shrinking) inland. Due to the extent of this dune system in the study area, there are various options for management interventions depending on the relationship of the dunes to the coastal zone.

In general, parabolic dune fields are more stable and less sensitive to disturbance in comparison to embryo dunes, but this also depends on the level of impact in the surrounding environment. The dunes’ relationship to core dune areas/corridors is also an important consideration. These dune systems have formed along the False Bay coastline and are important components of dune corridors. Dune corridors play a necessary role in conserving remnant dune systems and their natural resources. For this reason the remaining systems should be regarded as high sensitivity areas and should be managed with extreme caution in order to prevent further fragmentation and isolation from coastal dune systems.

³⁷ CCT (2004:13) Low and Pond

³⁸ CCT (2004:17) Low and Pond

³⁹ CCT (2004:13) Low and Pond

⁴⁰ CCT (2004:13) Low and Pond

Box 4.2: Management implications for parabolic dune fields within the study area

As the socio-economic and biophysical conditions and context of each dune system are different, their optimal use needs to be assessed on an individual basis, taking the wider socio-economic and biophysical contexts into account.

Parabolic dunes found within the embryonic belt should be regarded as a high sensitivity area together with those that are actively migrating inland and which resemble a functioning dune corridor. Parabolic dunes found deep inland should be treated as a medium sensitivity area. The botanical value of the dune and its connectivity to other dune systems should be established through a specialist study, and if found to be a fragmented, isolated dune remnant with no biophysical or socio-economic value, then it could be considered for development. If found to be a well vegetated, stabilized but isolated dune remnant (without connectivity to the coastline), retention of the dune area should be encouraged. The dune's potential for use as an open space and/or tourist/recreational resource would need to be investigated.

Dune sand over bedrock

According to CCT (2004:13) these are 'undifferentiated dunes that lack structure but cover bedrock'. Since these dune systems, by definition are described as unstructured accumulations of sand, the management implications are much less restrictive⁴¹. However, dunes that have formed over limestone are viewed in a different light as they tend to support important vegetation types. These are considered sensitive to development.

Box 4.3: Management implications for dunes formed over limestone within the study area

The Monwabisi system is the only dune type where the dunes have formed over limestone. The CMA limestone flora and habitat has been noted for its uniqueness and should be managed as a high sensitivity area. Dunes of this nature that have formed close to the high water mark should also be managed as 'no-go' high sensitivity areas.

⁴¹ CCT (2004:19) Low and Pond

SECTION FOUR
STRATEGIC ISSUE: HYDROLOGY,
STORMWATER AND FLOODING

4. SECTION FOUR

STRATEGIC ISSUE: HYDROLOGY, STORMWATER AND FLOODING

1. INTRODUCTION

The purposes of this section are:

- i. To provide an overview of the hydrological systems of Khayelitsha and Mitchell's Plain.
- ii. To discuss the role and use of the various components of the hydrological system, with particular emphasis on the constraints, conflicts (such as flooding) and opportunities associated with these uses
- iii. To identify and discuss the key challenges relevant to the management of the hydrological system. Recommendations are made to address the key challenges.
- iv. To suggest sensitivity ratings for the different elements of the hydrological system and the implications of these ratings for the assessment and processing of development applications.

Please refer to the hydrological sensitivity map (Map 3).

Statement of strategic issue: The hydrological system provides numerous ecological and social functions to residents in Khayelitsha and Mitchell's Plain. The hydrological system is made up of catchment areas, storm water, and river systems. There is also an aquifer which underlies most of Khayelitsha and Mitchell's Plain. Retention of the potential for this alternative water source to be utilized by the City of Cape Town is a strategic requirement. Winter flooding is a major problem in the study area, particularly in Khayelitsha. An integrated response is needed to address this issue. River systems play a strategic role in the management of storm water in Khayelitsha and Mitchell's Plain. They act as areas of both opportunity and conflict. These areas of opportunity and conflict need to be identified. Both qualitative and quantitative management approaches are needed to ensure public health and safety as well as the protection of the ecological and storm water management functions of urban river systems. The effectiveness of the management approaches need to be monitored so that the necessary modifications can be made.

2. OVERVIEW OF THE HYDROLOGICAL SYSTEMS FUNCTIONING IN KHAYELITSHA AND MITCHELL'S PLAIN

2.1 The catchment, storm water, river and aquifer systems in Khayelitsha and Mitchell's Plain

All the components of a hydrological system play an integral role in management of storm water in the area and cannot be discussed in isolation from one another. For this reason river and catchment systems are discussed within the context of storm water management in this report.

- a) Catchment systems: The major catchments include:
- (a) Khayelitsha
 - (b) Mitchell's Plain East
 - (c) Mitchell's Plain West
- b) The storm water system for Khayelitsha and Mitchells Plain consists of:
- Storm water ponds
 - Wetlands
 - Effluent ponds
 - Vleis
 - Quarry, and
 - Waste water treatment plant
- c) River systems: The Kuils river and the Khayelitsha wetlands

There is one major river system that falls within the study area. This is the Kuils River. It is located on the eastern boundary of Khayelitsha. The central low-lying areas of Khayelitsha contain a series of interconnected vleis, which formed part of the Kuils River floodplains. Before urbanisation on the Cape Flats and during periods of high rainfall, water from the river overflowed and filled the interconnected depressions and vleis in the central area⁴². These remained flooded for many weeks after the river had subsided since there was no natural outlet to the sea. Over the years the catchment has become urbanised and the terrain levelled. The topography in the urbanised part of the catchment now has very gentle gradients, which slope inwards towards an artificial drainage system that runs down the centre of Khayelitsha. The Kuils River remains part of the storm water management system but has been channelled to avoid flooding of the urban area⁴³. Some of the storm water collected in the eastern areas of the township is drained into the river. Flooding does however remain a problem in some areas, as can be shown on map [insert](#). This is further discussed in section [insert](#).

The Kuils River MOSS study and the Khayelitsha Wetlands Management study (Ninham Shand et al, 1999) identified that the river and its associated wetlands are highly degraded, but recommended that the river and its associated terrestrial ecosystem be treated holistically and managed and promoted as a green corridor linking the Tygerberg hills to False Bay. Despite the degraded nature of the system, it supports 167 indigenous species, 46 in riverine and wetland habitats, 111 in terrestrial habitats and 10 in both. Four species with Red Data status were recorded. At least 62

⁴² Wright, Kloppers and Fricke (1993)

⁴³ Wright, Kloppers and Fricke (1993)

indigenous species found in the Driftsands and Westbank areas can be used by local communities for a variety of purposes. A full list of the plants is contained in the Kuils River MOSS study. Some examples are Arum lilies (*Zantedeschia aethiopica*) for cut flowers, matjiesriet (*Cyperus textiles*) for basketwork and dekriet (*Chondropetulum tectorum*) for thatching and brooms. Harvesting of these plants occurs on an ad hoc basis with little or no financial or management investment back into the resource. Studies have shown that yields of traditional plant harvesting could be substantially increased through cultivation (Kuils River Moss study, 1999). If parts of the river corridor were used for nursery purposes there would be a significant number of people with vested interests to safeguard such areas. Cattle grazing is however, extremely destructive and should be reduced and formally managed.

Urban agriculture is another area of great potential. Although the soils in the Khayelitsha area are poor, trench gardening can lower the input costs and incorporate recycling. The Kuils river MOSS study supports this form of agriculture in appropriate areas. The Khayelitsha Wetlands Management Study (1999) recommends the initiation of urban agriculture (e.g. market gardening) in the riparian zone between the 1:50 year flood lines and the permanently wet areas. Infrastructure for irrigation and careful control of pesticides and fertilizers would be required in order to maintain the water quality of the river. A zone of grass swales and other devices to trap pollutants and nutrients from the food gardens may be required. An area of about 25 ha east of the 9SAI sewage works could provide an area for short-term stock grazing. However, the study recommends that over time, cattle and goat grazing in Khayelitsha be phased out as they cause significant erosion and water quality problems.

An area identified as being of regional conservation importance is the eastern section of the Khayelitsha wetlands as it supports a multi-species heronry where migrant birds nest between September and January. A further area of importance is the vicinity of the confluence of the Kuils and Eerste Rivers. There is also a rare fynbos community found on limestone sands in the south eastern corner of the wetlands, west of Baden Powell Drive. This community comprises dwarf limestone fynbos as well as seasonal vlei species associated with the seasonal pans on the limestone. This is an extremely rare habitat and includes three Red Data species.

Please refer to the figures 2.1.1a), b) and c) showing these areas. These maps have been reproduced from the Khayelitsha Wetlands study and the Kuils River MOSS.

d) The Cape Flats aquifer

(The information given below has been summarized from a report compiled by the CSIR in March 1995).

The Sandveld Group deposits constitute what is known as the Cape Flats aquifer. The aquifer is regionally unconfined and internally is essentially free of lateral hydraulic or geological boundaries which may influence regional behaviour. The aquifer is not hydro-geologically linked to any other aquifer, except the talus/scree material along

the foot of the mountains in the west. The aquifer pinches out against 'impermeable' boundaries in the east, west and north, while the southern boundary is defined by the coastline extending along False Bay between Muizenberg and Macassar. The aquifer is recharged principally from precipitation within the catchment. Groundwater flow in the Cape Flats is either to the west to Table Bay or south to False Bay. The water in the main part of the aquifer has a fairly low salinity but is relatively hard. There is a build up of salts in some pockets of the aquifer due to very high evaporation rates. The aquifer has been significantly affected by urban development but is still regarded as a viable supplementary water source for Cape Town (see section 2.3d).

2.2 Development and modification of the Mitchell's Plain and Khayelitsha hydrological system

Khayelitsha and Mitchell's Plain were constructed in the 1980s or earlier. Dunes were flattened and replaced by residential units. Over the years rapid urbanisation has altered the hydrological system in the following ways:

- river water was canalized on a large scale
- wetland areas were in-filled and drained to allow for urban development, and
- some infrastructure was inappropriately located in relation to hydrological resources (for example the landfill site and waste water treatment works)

This approach resulted in a decline in the water quality and ecological integrity of rivers and vleis⁴⁴.

Many storm water ponds were created as remnant wetlands began to fill up with storm water after dunes had been leveled⁴⁵. A drainage system was established in order to manage storm water in the area, and over the years this system has been modified in order to accommodate the growing population in Khayelitsha and Mitchell's Plain. The storm water network is typically made up of rivers and streams, lined canals, underground pipes and culverts, storm water detention ponds, and automatic pumping stations⁴⁶. Currently, the storm water runoff flows through a storm drain (street grate) and enters a storm water culvert (or sewer) where water drains into the nearest river or sea. Storm water entering storm culverts (sewer) does not usually receive any treatment before it enters streams, lakes or other surface waters.

Storm water ponds found within the catchment areas of Khayelitsha and Mitchell's Plain play a crucial role in the storm water system in the area. Many open spaces have also been retained to collect storm water and to reduce the risk of flooding of surrounding areas. (Refer to map 3)

⁴⁴ CCT(2001)

⁴⁵ Observation from GIS attribute data

⁴⁶ CCT (2001:12)

2.2.1 Main drainage features that support the storm water system in Khayelitsha and Mitchell's Plain

The table below presents a numerical count and brief description of the main storm water drainage features in each of the four major catchment areas in Khayelitsha and Mitchell's Plain.

Table 2.2.1.1: Drainage Features in Khayelitsha and Mitchell's Plain⁴⁷

Catchment Area: Khayelitsha		
Description: Khayelitsha has two main storm water collectors which follow a south-easterly direction through the centre of the catchments into the main outlet canals. These drain into a detention basin upstream of the coastal outlet. ⁴⁸ The final retention basin, with an area of 60 000m ² , located north of the Monwabisi resort provides for both flood control and pollution reduction through settling and dilution ⁴⁹ The system is designed for a 1:100-year floodline. The areas located along the main collector drains have been developed as sport fields and open spaces. Although much of the Khayelitsha area has been disturbed through urbanisation many of the natural features remain. The most sensitive environmental features are the Cape Flats aquifer and the Kuils River Wetland System.		
Storm water classification system	Number within the catchment areas	Description
Storm water ponds	27	Includes: Storm water ponds, and Ponds created by earthworks – temporary
Wetlands	1	Includes: Wetland created through development preventing natural runoff – also used for storm water management.
Effluent ponds	6	Includes: Storm water management – wet pond
Vlei	3	Includes: Vlei created through sand mining in wetland
Quarry	5	Includes: Pond created by earthworks – temporary, and storm water ponds

⁴⁷ Table was adapted from GIS data

⁴⁸ Wright, Kloppers and Fricke (1993:10)

⁴⁹ Wright, Kloppers and Fricke (1993:10)

Catchment area: Mitchell's Plain West		
Storm water classification system	Number within the catchment areas	Description
Storm water ponds	40	Storm water ponds only
Wetlands	0	None
Effluent ponds	3	Storm water pond only
<i>Vlei</i>	0	None
Quarry	1	A remnant of wetland filled by run-off after dunes were leveled for development, storm water pond
Catchment area: Mitchell's Plain East		
Storm water classification system	Number within the catchment areas	Description
Storm water ponds	20	Storm water pond only
Wetlands	1	Wetland made permanent through development increasing runoff and restricting outflow
<i>Effluent ponds</i>	1	Effluent pond in refuse tip site
<i>Vlei</i>	0	None
Quarry	0	None
Catchment area: Mitchell's Plain Khayelitsha		
Storm water classification system	Number within the catchment areas	Description
Storm water ponds	3	Storm water pond only
<i>Wetlands</i>	3	Includes: Ephemeral wetlands between dunes and treatment works
Effluent ponds	33	Includes: Effluent pond for treatment works, and overflow pond of effluent pump station
<i>Vlei</i>	0	None
Quarry	0	None
Waste Water Treatment Plant	3	Effluent ponds only

According to a study on the Mitchell's Plain storm water culvert system (July 1998) an additional 26 small to medium sized storm water detention ponds are required to alleviate overloading of the existing storm water system. These areas have been identified and are noted in the July 1998 study. They are included on the hydrology map 3.

2.3 The multiple roles and functions of the hydrological system

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There has been a growing movement at local, regional and national levels to ensure an improved approach to managing urban storm water systems in a manner that balances competing and often divergent needs of the community, such as⁵⁰:

- flood protection,
- ecological enhancement and protection of aquatic systems, and
- cultural, recreational and economic opportunities .

Storm water retention areas can also play an important role in the ecological functioning of rivers and adjacent open spaces. Development is likely to impact on the overland flow of rainwater by replacing natural ground cover with impermeable surfaces such as tarmac or concrete. A storm water management system mitigates against the influence that development has on surface water runoff and provides a system in which effective drainage can take place.

a) Flood protection

Storm water systems play an important role in drainage, flood control and control of surface water runoff. The engineering and water control requirements have been the dominant influence in the design of the storm water infrastructure. The design of these systems and the socio-economic context within which they are located, has led to many conflicts e.g. blocking of the storm water infrastructure by sand and litter (which contributes to localized flooding and high maintenance costs) and the health and safety risks experienced by the surrounding communities. This issue is further discussed in section 3.1e.

b) Ecological role

Rivers, such as the Kuils River often support sensitive aquatic and riparian ecosystems that need to be protected or buffered from impacts associated with adjacent developments or activities⁵¹. The beds of many watercourses, particularly on the Cape Flats, are dynamic and prone to erosion, sedimentation and meandering⁵². This must be taken into consideration when evaluating development proposals in such areas.

⁵⁰ CCT (2001:15)

⁵¹ CCT (2003:3)

⁵² CCT(2003:5)

As noted in the biodiversity prioritization study, the connected nature of aquatic ecosystems requires the protection of areas of freshwater biodiversity beyond the borders of the node. Riverine corridors thus play an important role in biodiversity conservation and maintenance of the overall ecology of rivers and wetlands. Similarly, it is important that rivers and wetlands be protected by appropriate buffer zones (see appendix 2 - flood management guidelines).

- c) Use of rivers and storm water systems for cultural, religious, recreational and economic purposes

Rivers and storm water systems are utilized for cultural, religious and economic purposes, as shown in Table 2.3.1 below.

Table 2.3.1: Use of river and storm water systems for socio-cultural purposes

Khayelitsha	Mitchell's Plain
Initiation Schools. Male circumcision schools (see cultural and heritage assessment)	Harvesting of medicinal plants (see cultural and heritage assessment)
Harvesting of medicinal plants (see cultural and heritage assessment)	
Cattle grazing	
Baptism (see cultural and heritage assessment)	
Fishing	Fishing
Reeds used to make baskets and reed mats	

Use of rivers and storm water retention areas for recreational purposes is limited. None of the river areas have, as yet, been developed for recreational purposes. River and storm water areas are not generally perceived as recreational areas although children can often be seen playing in these (often highly polluted) areas. A long history of negative experiences with water areas due to safety and pollution factors discourages the full utilization of the river and storm water system.

- d) Potential for use of the aquifer

The Cape Flats Aquifer has been identified as a potential source of water for Cape Town. In the City of Cape Town Integrated Water Resource Planning Study⁵³, the aquifer was one of several options investigated to supplement bulk water supply. The key findings of the assessment of the aquifer's potential are summarized below:

⁵³ City of Cape Town Integrated Water Resource Planning Study: Cape Flats Aquifer: Final report October 2001. Prepared by Ninham Shand and LawGibb Group. Report no 4 of 12.

- The aquifer has an estimated sustainable yield of 18Mm³/a and can be utilized throughout the year,
- The location of the Swartklip Waste Disposal site and the Mitchell's Plain waste water treatment works have increased the possibility of pollution of the aquifer water. It is however possible to design the layout of the well-field to minimize the pollution potential. A potential layout is illustrated in figures [insert a\)](#) and [b\)](#) which have been reproduced from the Integrated Water Resource Planning Study. The scheme would involve the drilling of 41 production and 20 observation boreholes as well as a water treatment works, buffer reservoir and pump-station.
- The recommended well-field design would involve locating most of the high yielding boreholes in the parks, school grounds and open public spaces in the high yielding zones, but would avoid the waste site and Mitchell's Plain water treatment works. The boreholes in the eastern zone would have to be located in the north-eastern corner of the high yielding zone so that the boreholes would be upstream of the old and the existing Swartklip waste disposal site. The possibility of pollution from these sources would thus be mostly negated. The boreholes in the western zone would be located to the east, west and north of the Mitchell's Plain waste water treatment works. The boreholes would be located as far as possible (at least 500 m) from the Philippi agricultural area to reduce the impact of pumping on the area.
- The possibility of seawater intrusion is limited because of the distance of the well-field from the coast.
- The water from the aquifer is extremely hard but there are means to address this problem. Softening, filtration and disinfection will be necessary.
- The main source of recharge for the aquifer is precipitation within the catchment basin, which is normally between 500 and 800 mm per year. Recharge was calculated in 1980 when the Cape Flats were dominated by a dune-scape invaded by 'rooikrans' and 'Port Jackson'. The recharge estimates have not been recalculated following urbanization of the Cape Flats. The impact urbanization has on recharge is expected to be positive due to concentrated rivulets of storm water from roofs and paving which can percolate into the aquifer. Light rainfall events, which normally would not have resulted in recharge events add to the recharge of the aquifer due to the more concentrated runoff. The removal of alien vegetation which utilizes a lot of water and its replacement with either irrigated gardens or barren open space also facilitates recharge. Subsequent to clearing and the housing development in the Blue Downs area, the water table has risen to such an extent that it is problematic.⁵⁴
- An initial consideration of the potential environmental and social impacts associated with water abstraction indicated that there are unlikely to be any impacts that cannot be addressed. However, should consideration be given to utilizing the aquifer water, a full environmental impact assessment will be required.

In summary, the future potential to utilise Cape Flats Aquifer water has to be protected. This means that any activities proposed in the high potential aquifer areas

⁵⁴ CSIR Report submitted to Ninham Shand Consulting Engineers: November 2000. Groundwater impact scoping for the Cape Flats Aquifer. Report no ENV/S-C 2000-123. Prepared by L. Fraser and J. Weaver.

have to take account of water quality and water abstraction and recharge requirements. Prior to development of any open space, reference should be made to the proposed location of the boreholes in order to ensure sufficient space is retained for water abstraction and transport. Any proposed activities which have the potential to significantly affect water quality should be prevented, particularly in the high yielding areas of the aquifer.

3. MANAGEMENT OF THE HYDROLOGICAL SYSTEM

3.1 Key factors to be taken into account in the management of the hydrological system: constraints and opportunities

There are a variety of factors that have an effect on the hydrological system in Khayelitsha and Mitchell's Plain and therefore affect its management. These are briefly discussed below.

The following factors (a - h) represent the key problem areas that need to be considered in planning and management of the hydrological areas. These factors also need to be taken into account in the preparation and assessment of development applications.

a) Planning considerations

Flood plains and open spaces are generally low-lying to surrounding areas and become partly flooded during the high rainfall season. Development of hard surfaces on low lying areas usually requires engineering solutions which have high maintenance and repair costs.

In order to ensure that the storm water management system works effectively, features that assist in the drainage of surface water need to be protected in their natural state to function optimally. Most of the storm water ponds found in Khayelitsha and Mitchell's Plain are zoned as public open space and some have been identified as high priority MOSS areas (refer to map 5).

An integrated approach is needed to ensure that developments on land adjacent to drainage features and other hydrologically sensitive areas (such as wetlands) do not affect their functioning. Developments that are likely to cause pollution of groundwater need to be located in areas outside the key aquifer zone (for example sewage and waste sites, industries). Planners and authorities should ensure that development takes place in areas that are not prone to seasonal flooding rather than engineering a site to improve its suitability for development.

b) Flood risk areas

Based on the rainfall statistics for 2004, flooding is widespread in Khayelitsha and Mitchell's Plain. Many incidents of localized roadway flooding and traffic disruption on the Cape Flats have been recorded⁵⁵. During the month of July 2004, 262 roads were flooded, 49 properties and buildings damaged, and 400 informal dwellings affected negatively in Strandfontein. In the following month 502 roads were flooded, 102 buildings and properties were damaged and 4500 informal settlements affected along the Kuils River⁵⁶.

⁵⁵ CCT (2003-2004:7)

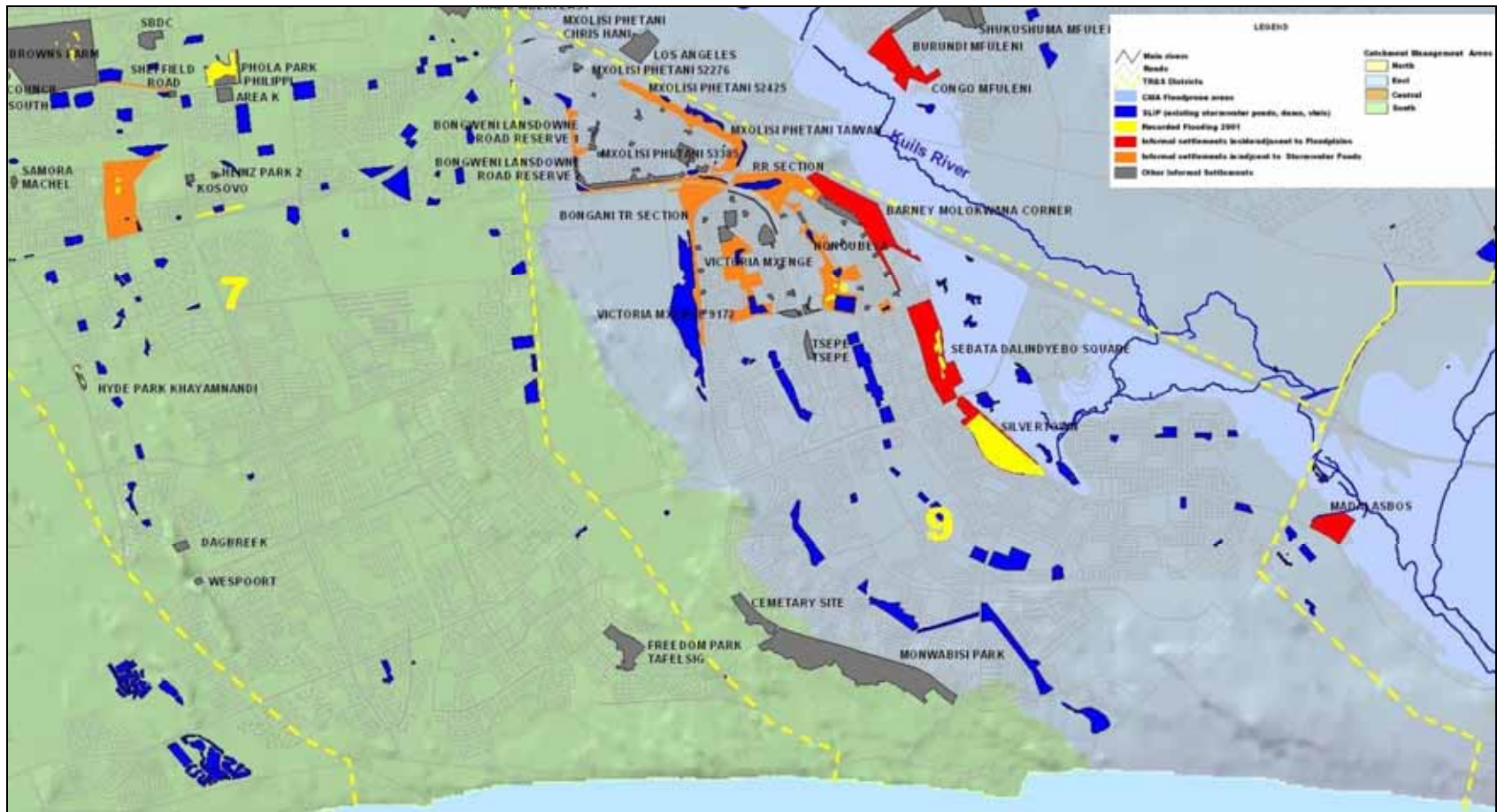
⁵⁶ CCT (2003-2004:7)

The Catchment, Stormwater and River Management directorate of the City of Cape Town have identified flood risk areas for the City of Cape Town. Those areas that fall within Khayelitsha and Mitchell's Plain are included in the table below and should be read in conjunction with the flood risk map.

Table 3.1.1: Flood risk areas in Khayelitsha and Mitchell's Plain

Flood risk	Area names	Khayelitsha/Mitchell's Plain
Flood prone areas:	Areas alongside the Kuils River, this includes Barney Molokwane corner, Sebata Dalindyebo square, and Silvertown	All areas fall within Khayelitsha
Recorded flooding in 2001	Silvertown and Sebata Dalindyebo square	All areas fall within Khayelitsha
Informal areas adjacent to storm water ponds	Includes the following areas: Nonqubela, Victoria Mxenge, Washington square, Mandalay, and Site C	All areas fall within Khayelitsha
Informal settlements adjacent to flood plain areas	Includes the following areas: Soloman Mahlangu, Trevor Vilakazi, and Silvertown	All areas fall within Khayelitsha

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Map 3.1: Flood risk areas in Khayelitsha and Mitchell's Plain

c) Encroachment of informal settlements into storm water management areas

Informal settlements have been constructed on and/or near storm water ponds. Storm water ponds are high flood risk areas, especially during the winter season. The presence of informal settlements has a negative impact on the water quality in storm water ponds and wetland areas and may also affect the ecological integrity of such systems as seen in the picture below. Encroachment of settlements into storm water management areas poses a health and safety risk to the affected communities, which in turn increases costs to public services and results in loss of productivity.



Picture 5: Encroachment of informal settlement into a storm water detention area

Retaining open spaces provides a lower cost and lower maintenance system to control storm water relative to other engineering options. However, informal settlements are rapidly encroaching into storm water ponds, particularly in the northern section of Khayelitsha. Development in these areas should be strictly managed to ensure that hard surface development is restricted to the higher and drier parts. The informal settlements adjacent to storm water ponds and flood plain areas should be relocated to more suitable sites. This is particularly important in the Victoria Mxenge, Nonqubela, Washington square, Mandalay, and Site C areas.

The storm water function does not necessarily exclude development on these sites, but any change of land use must take into account the storm water management system. Adequate measures, such as partial development of the site, should be taken to ensure the storm water control system's continued functioning. The City of Cape Town's Catchment, Storm water and River management department has developed a comprehensive database of information that can be used for the screening of development proposals which may have an impact on storm water and river systems.

Areas at risk are identified and highlighted in this EMF. A list of the available information is given in Appendices 2 and 3.

There is also a need to alert and educate residents abutting these areas as to their importance and the need to keep them clean and functional, e.g. signage, open space management, cleansing, demarcation of edge. This is due to the problems being experienced from wind blown sand, illegal dumping and litter which collects in the storm water system which then backflows.

d) Illegal dumping

Many areas that play a role in managing storm water in Khayelitsha and Mitchell's Plain have been retained (and zoned) as public open space⁵⁷. These open spaces are often not well defined or maintained and are commonly used illegally as dumping areas (see picture below). Pollutants from the dumped materials are washed off during storms (typically in winter) into storm drains and directly into the stream, river, or bay. The waste also clogs the storm water system and contributes to street flooding and damage to public and private property. The pollutants pose a significant health hazard to the people (particularly children) living in the surrounding area.



Picture 6: Illegal dumping of waste

e) Water quality, health and safety

Complaints have been received from parents living in Khayelitsha. Children who have been swimming and playing in the Kuils River have contracted diseases⁵⁸. Storm water runoff from areas adjacent to the river is a major source of pollution and linked

⁵⁷ Observation drawn from 2004 zoning map for Khayelitsha and Mitchells Plain

⁵⁸ CMC(1999) extracted from Appendix. Notes from public meeting on 09 July 1998

to the poor water quality of the Kuils River. Pollutants (sources) include nutrients and bacteria (e.g. leaky sewers, septic tanks, and animal defecation), oil and grease (motor vehicles), toxic and synthetic chemicals.

The Khayelitsha wetland is less polluted than some parts of the Kuils River due the presence of reeds and their filtering effects. Much of the wetland is dominated by reed beds and although they are highly invasive as they repress other indigenous species, reeds nevertheless assist in reducing pollution levels and sedimentation in the river.

f) Reeds

Wetland and river areas infested with reeds are regarded as dangerous to children and people crossing the river. Criminals use them as hiding places from which to ambush passers-by⁵⁹. Reeds also block the movement of water into the Kuils River and this has led to flooding, which has damaged streets and houses during periods of high rainfall⁶⁰. There is therefore a need to control the growth and spread of reeds in certain areas. The aforementioned benefits of reeds (as a resource and as a means of pollution attenuation) do however need to be taken into consideration.

g) Livestock farming

Some residents in Khayelitsha are involved in livestock farming which include sheep, goats and some cattle. The ownership of cattle is an extension of the deep rooted 'cattle culture' of the Eastern Cape. Over the years there has been an increase in low intensity livestock farming, especially in the Khayelitsha Wetlands area and surrounds. This has brought about competition for use of scarce land resources. The defecation (of livestock) also enriches the nutrient content of the wetland and contributes to ecological degradation though high E coli and F coli counts which present a risk to human health⁶¹.

h) Lack of awareness of the storm water system

The community is not aware of the existence of storm water management plans for the area⁶². They are unlikely to be aware of the role of storm water control areas and the need to retain and manage them correctly. There is therefore a need for awareness raising in this respect. Community involvement and signage are essential.

The following factors (i - m) may provide opportunities to maximize benefits to be derived from the storm water network.

i) Urban agriculture

⁵⁹ CMC(1999) extracted from Appendix. Notes from public meeting on 09 July 1998

⁶⁰ CMC(1999) extracted from Appendix. Notes from public meeting on 09 July 1998

⁶¹ CMC (1999:66) Khayelitsha wetlands management study

⁶² CMC(1999) extracted from Appendix. Notes from public meeting on 09 July 1998

There is demand for space for food gardens in Khayelitsha particularly. Non-Government Organisations such as the Food Garden Association and Abalimi Bezakhaya, who support this activity, have made more requests for land for this purpose. According to the Khayelitsha Wetlands Management study (1999:65) the riparian strip between the permanently inundated area and the 1:50 year floodline appears to be suitable for this purpose.

j) Recreation

The Kuils River is currently used for recreational purposes. Residents of Khayelitsha have complained that there is no high quality landscape parkland in Khayelitsha where residents can picnic and have photographs taken for special events such as weddings⁶³. There are significant opportunities to create such areas. (Refer to URSDF for Khayelitsha and Mitchell's Plain). Significant opportunities exist for development of a linear amenity with associated parking areas, access points and road crossings. Such areas need to be designed taking safety and security requirements into account.

(Refer to the Kuils River MOSS study for land use plans and management policies for the riverine corridor, which forms the basis for future planning along the Kuils River corridor).

k) Environmental education and awareness

Awareness about the importance and role of the hydrological system needs to be raised, together with information about the risks, hazards and opportunities associated with these areas. Information signage and awareness raising programs should be integral components of projects or programmes taking place adjacent to or near hydrological features or sensitive areas. Awareness of the need to minimize pollution of all water courses and retention areas should also be raised. There are many opportunities to improve the utilization of these areas.

l) Community involvement

Opportunities to involve community members in the development and management of the river should be identified and implemented. Green team projects have been initiated by the private sector and are supported by the communities⁶⁴. Pilot projects could be developed to instil a sense of ownership by communities.

m) Removal of Alien vegetation

The Khayelitsha wetland would benefit from extensive acacia and water hyacinth removal, whilst some control on the extent of bull rush might also be necessary. A separate study is required to evaluate the edge of the wetland, particularly where it interfaces with Khayelitsha. The limestone area needs priority attention with acacia

⁶³ CMC (1999:65) Khayelitsha wetland management study

⁶⁴ CMC(1999) extracted from Appendix. Notes from public meeting held 28 May 1998

control as a key factor. There are potential opportunities for job creation here.

3.2 Allocation of sensitivity ratings

This section indicates the sensitivity of the various hydrological features/systems to development activities. The purpose of allocating these ratings is to alert developers, communities and authorities to areas and factors that need to be taken into account in assessing development proposals in potentially sensitive areas. The sensitivity ratings also indicate what level of environmental assessment is likely to be necessary as they correspond to the control zones (high and medium) described in section 2 (EMF).

The City of Cape Town has undertaken studies to assess many of the rivers and wetlands in the Cape Town area (2001: Catchment Management Branch). In 2002 they developed a Catchment, Storm water and River Management Strategy which is effective until review in 2007. The information from these documents has been used to inform the development of the Biodiversity Network. The strategy aims at facilitating:

- Effective storm water drainage
- Improved water quality of surface, ground and coastal waters
- Ecologically healthy rivers, vleis, dams and wetlands
- Multi-functional, sustainable use of river corridors, and
- Active support of the City of Cape Town's Indigenous Fauna and Flora Policy and Biodiversity Strategy and Biodiversity Network

The development of the Biodiversity Network utilized information from these previous studies and involved allocation of a category A, B or C for each protected area, 'natural habitat remnant' (NHR), wetland and river reach. For additional information on the Biodiversity Network, please refer to section 5 (Open space systems and resources) of this report.

Category A river reaches have the greatest ecological priority and rehabilitation potential. Category B includes all rivers that are considered as having moderate or modest ecological priority and Category C includes all reaches that are considered as having low ecological priority. These are river reaches that are highly modified, with an extremely limited rehabilitation potential. Many of these river reaches would be canalized.

However, it was concluded that overall, data for freshwater systems is insufficient to effectively prioritise river reaches for management purposes. On the precept that all rivers and wetlands are important and should be protected, it was suggested that all rivers and wetlands be classified as category A components of the Biodiversity Network and that the categorization be used to inform future management.⁶⁵ For this

⁶⁵ CCT (2004:22)

reason all river reaches and wetlands in Khayelitsha and Mitchell's Plain are allocated a high sensitivity rating. Storm water control structures (such as retention ponds), which are usually linked to or part of a river or wetland system are allocated a medium sensitivity rating. Storm water control features which are not linked to or part of a river or wetland system would be potentially less sensitive than those that are linked. Those rivers and storm water management areas that create corridors of open space should be considered more sensitive to development. The Biodiversity Network study has pointed out the importance of riverine corridors in biodiversity protection. It gives guidelines for selection and management of riverine corridors within the City. Key points made are that:

- The basis of selecting riverine corridors should be both to ease movement and improve the status of the water quantity and quality regime within the river reach concerned
- The width of the corridor should be determined through assessment of the type of river reach within the corridor and should include the river itself and an appropriate buffer or setback zone.
- The management of both water quality and quantity within a corridor should take into account the types of ecosystems located downstream of the corridor.
- Landuse guidelines for riverine corridors should be influenced by water quantity and quality criteria, i.e. activities that alter quality or quantity of water in a river should be excluded⁶⁶.

Buffer zones are an important management strategy. The City of Cape Town Floodplain Management Guidelines (2003), indicate how ecological buffer widths should be determined. Ecological buffer widths are influenced by the ecological status and importance of a particular watercourse. Systems with a high ecological status and importance require a larger buffer than those that have been exposed to considerable modification (e.g. canalized rivers). Buffer widths are either determined from the watercourse centerline or top of bank as appropriate. Buffer widths have been determined for all the significant watercourses and certain wetlands with the metropolitan area and vary in width between 10 and 60 m. Refer to GIS information list for Development Control given in appendix 2.

Where buffers have not yet been determined, the developer should appoint an ecologist and/or geologist at their own cost in order to determine buffer widths⁶⁷.

3.3 Conclusion

In summary, the hydrological system in Khayelitsha and Mitchell's Plain is a major influence on development patterns and quality of life for the residents. There is a need for the urban renewal programme to support projects that can turn presently hazardous areas into areas of opportunity. There are many types of open space oriented activities that can take place along the river corridors and storm water routes

⁶⁶ CCT (2004:18)

⁶⁷ CCT(2003:5)

if they are well designed and managed. Such activities include parks, urban agriculture and sports fields. These areas need to be carefully designed, taking aspects such as water quality, flood risk and the social context into account. Activities that are unsuitable include those that have the potential to cause pollution (surface and ground water) or those which will significantly affect the storm water management system due to, for example, hardening of surfaces. There is a perception amongst the local community that canalizing all remaining river systems will solve the flooding problems. Engineering solutions have their place but also require ongoing high cost management. Maximisation of the use of natural capacity of rivers and wetlands to harness and cleanse rain and storm water needs to be promoted in conjunction with the development of a viable open space system.

SECTION FIVE
STRATEGIC ISSUE: ENHANCEMENT OF
OPEN SPACE SYSTEMS AND RESOURCES

5. SECTION FIVE

STRATEGIC ISSUE: ENHANCEMENT OF OPEN SPACE SYSTEMS AND RESOURCES

1. INTRODUCTION

The purposes of this section are to:

- i. Provide an overview of land identified as open space in Khayelitsha and Mitchell's Plain
- ii. Identify the core open spaces that have strategic significance in terms of the Metropolitan Open Space System (MOSS) and the Biodiversity network
- iii. Identify key threats and opportunities related to the management of these areas (further developed in section 2 EMF).

Statement of strategic issue:

There are two interrelated issues being considered in this section:

a) *The appropriate usage of the remaining open spaces in Khayelitsha and Mitchell's Plain*

Cape Town's 2020 Vision expressed in the latest draft of the IDP states that Cape Town aims to be a city with "a safe green area within walking distance for all". Open spaces are the unbuilt component inside Khayelitsha and Mitchell's Plain area that serve a variety of purposes and functions⁶⁸. Some open spaces serve specific ecological and/ or hydrological functions (such as protecting and providing linkages between natural habitats, providing areas for recreation as well as areas to attenuate storm water) whilst others are simply undeveloped. A balance needs to be found between allocating sufficient land to allow these flows and activities to function, and satisfying the urban development needs of the Khayelitsha and Mitchell's Plain community for housing, infrastructure and commercial activity⁶⁹. The Biodiversity Network Prioritisation Project has recognized, that although open spaces serve other primary functions, they also play a role in maintaining biodiversity. Open space includes rivers, ecological buffer zones along rivers, areas forming part of the storm water management system, linear parkways, parks, scenic drives, road verges, servitudes and transport routes.

b) *The conservation and sustainable utilization of the area's biodiversity and its associated resources*

Maintenance of biodiversity has been recognized as being essential to the continuation of life. A diverse and functional natural environment provides resources (such as plants for food and medicine) and services essential to life (e.g. breakdown of pollutants in water and soil) and also is better able to respond to / recover from extreme events (such as floods or changes in climate). The City of Cape Town has very high levels of biodiversity within a relatively small area. The Cape Flats has remnants of some of the rarest plant communities in the Western Cape. The Biodiversity Prioritisation Study has identified the Wolfgat Macassar node, the Kuils

⁶⁸ CMA (2000:12) MOSS – Phase 1

⁶⁹ CMA (2000:12) MOSS – Phase 1

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River Wetlands, the Swartklip site and the False Bay coastal corridor as being of strategic biodiversity importance. ‘The challenge is to find socially relevant and economically viable approaches to conserving biodiversity within a Network that is a vital part of an open space system for the metropolitan area’.⁷⁰ Means to ensure that the biodiversity network serves a wide range of social and economic needs, such as education and youth development, recreational activities and tourism development need to be recognised and developed. Development proposals that prevent the optimal use of the biodiversity network thus need to be rejected or significantly modified. The process of finding means to address socio-economic needs, utilizing resources made available through the retention of the Biodiversity Network has begun in False Bay, where focus has been placed on the Wolfgat – Macassar Node.

Despite being surrounded by natural areas, the residents of Khayelitsha and Mitchell’s Plain have few high-quality open spaces that are safe and accessible. The open space network for Khayelitsha and Mitchell’s Plain does exist but is very poorly developed and maintained within residential areas. This results in vast tracts of underutilised open spaces within communities⁷¹. Open spaces have not been functionally developed for active recreational, cultural or tourism purposes. People show an increased desire for open space as their living conditions improve⁷². It is therefore important in the planning stage to take into account the future needs for open space. The City of Cape Town focuses extensively on improving urban open space in poorer communities. ‘Dignified places’ are seen to be essential for the community, the economy and recreation.

1.1 The benefits of open space

Table 1.1.1: Ecological, social, engineering and economic benefits of open spaces⁷³
Ecological benefits: such as biodiversity conservation, erosion control, flood attenuation, water supply, flood protection, clean air, etc
Engineering benefits: such as flood pathways, storm water drainage, erosion control, water supply, hazard avoidance (e.g. buffers to noise), etc
Social benefits: such as urban growth management, social integration of neighbourhoods, community/neighbourhood revitalisation, opportunities for education, recreation and social interaction, spiritual and health functions, visual qualities, flood attenuation, flood protection etc
Economic benefits: such as income generation, creating investor confidence through improving the urban environment and adding value to property, economic exchange through informal and formal trade, tourism, agriculture, animal husbandry etc.
Botanical and ecological significance: Sites that are home to rare plant species and ecological features such as wetlands must be retained as open spaces. This will assist in protecting biodiversity on a regional level and ensure that the aesthetic value of the site is retained. Development is unsuitable in formal protected areas such as nature reserves. Any development in areas with proposed protection status should be minimised.

⁷⁰ CCT (2004) Biodiversity Network Prioritisation Project Draft 2.1

⁷¹ CMC(1999) Khayelitsha SDF – Draft 1

⁷² Minor et al (2004)

⁷³ CMA (2000:14) MOSS – Phase 1

Conservancy agreements with Cape Nature can assist in ensuring ongoing retention and maintenance of biologically valuable areas. Development in areas that have been proposed to form part of the MOSS should be carefully planned so as not to foreclose the opportunity for the establishment of a MOSS site.

Storm water function of the open space: Storm water management in Khayelitsha and Mitchell's Plain relies heavily on the use of natural open space corridors. Many of the internal open spaces play an important role in the area's storm water management. Retaining such areas as open space provides the authorities with low cost storm water control relative to the cost of engineering measures. Such open spaces can serve multiple functions such as recreation and sport, providing additional economic and social benefits.

Potential for linkages to other open spaces: Planning guidelines such as the draft URSDF emphasise the importance of linking open spaces to create green corridors. The MOSS identifies these areas as continuous multi-functional open space systems. Such corridors form ideal walking and bicycle routes. They also serve as biological corridors for plant and animal species to migrate. The connectivity of open spaces should therefore be maintained. This implies that central areas and other crucial parts of open space corridors should not be developed.

Relative significance of the open space in the area: The retention of an open space is more important when there are no other open spaces available in the vicinity. The URSDF recognises the need to rationalise open space and discusses this issue in more detail.

1.2 The biodiversity network

It should be noted that the City of Cape Town has been undertaking a Biodiversity Network Prioritisation Project which has provided much of the information for this section. Some background information on the project is given below.

Cape Town lies in the extreme south west of the Cape Floral Kingdom, an area of global biodiversity significance. Despite the loss of extensive areas of natural vegetation, habitat and fauna, through urbanization, agriculture, mining and alien plant invasion, Cape Town remains internationally significant as a 'hot spot' of biodiversity⁷⁴. Biodiversity is defined as *the number and variety of species of plants and animals; genetic variability within species; and, the diversity of habitats and ecosystems, including landforms.*

The transformation of natural environments in Cape Town has severely impacted lowland habitats and their associated vegetation types. The World Conservation Union recommends that a minimum of 10 per cent of each vegetation type be conserved. Of the four primary vegetation types found in Cape Town (sand plain fynbos, dune thicket, west coast renosterveld and mountain fynbos) two lowland types, namely sand plain fynbos and west coast renosterveld are under extreme threat.

⁷⁴ CMC Administration, City of Cape Town: Identification of a Biodiversity Network for the City of Cape Town. January 2003. Prepared by Geographical Information Systems and Department of Botany, University of the Western Cape.

Sand plain fynbos, which occurs on the Cape Flats (i.e. within the study area) has less than one per cent remaining. Dune thicket is also strongly represented in the study area.

The Cape Action Plan for the Environment (CAPE) project found that all of the remaining areas of extant habitats of two Cape Floral Kingdom lowland Broad Habitat Units (BHUs), namely Cape Flats Fynbos/Thicket Mosaic and Blackheath Sand Plain Fynbos, represented in Cape Town need to be conserved in order to meet basic regional conservation targets.⁷⁵

The City of Cape Town is committed to ensuring the conservation and protection of the unique biodiversity within its boundaries. The Integrated Metropolitan Environmental Policy (IMEP), adopted in 2001, has several sectoral strategies, one of which is a Biodiversity strategy. The strategic objectives of the Biodiversity strategy are:

- Primary Biodiversity⁷⁶ (conservation and biodiversity nodes)
- Secondary Biodiversity⁷⁷ (conservation through corridors, links and mixed use areas)
- Conservation of biodiversity in freshwater aquatic systems
- Invasive alien species management
- Biodiversity legislation and enforcement
- Biodiversity information and monitoring system
- Biodiversity education and awareness.⁷⁸

A key step in implementing the Biodiversity Strategy (adopted by the CCT in October 2003) is the identification of a biodiversity network for the long term protection of biodiversity in Cape Town.

The biodiversity network forms part of the city's metropolitan open space system (CMOSS) and is made up of formally protected areas (e.g. Table Mountain National Park, Wolfgat Nature Reserve, etc), as well as land parcels that have no formal

⁷⁵ Ibid

⁷⁶ Primary Biodiversity Conservation refers to the establishment and effective management of a network of biodiversity areas and biodiversity nodes that are actively managed with the primary function of conserving Cape Town's biodiversity. Primary Biodiversity of the Network refers to all terrestrial and freshwater components of the areas prioritized as A and B or which are defined as biodiversity nodes in the network.

⁷⁷ The Secondary Biodiversity strategic objective refers to all areas that are not actively and specifically managed with a primary function as biodiversity conservation areas but which connect the Primary Biodiversity Areas and biodiversity nodes into a complete and functional Biodiversity Network. These areas are usually open space areas such as rivers, ecological buffer zones along rivers, areas forming part of the Storm-water management system, linear parkways, parks, scenic drives, road verges, servitudes and transport routes. These areas facilitate the movement of species from one area to the next by acting as corridors and links (City of Cape Town, June 2004).

⁷⁸ City of Cape Town Biodiversity Network Prioritisation Project. Final Report. June 2004. Report prepared by Marlene Laros & Associates – Sustainability Matters in association with Biodiversity & Conservation Biology Department University of the Western Cape, Settlement Planning Services, GISCOE and the Freshwater Consulting Group.

conservation status but contain significant natural habitat remnants. Where possible the network has been designed to consolidate and connect important habitat remnants, as is the case along the False Bay coastline. Collectively the network serves to sustain ecological patterns and processes in an urban environment.

The Biodiversity Network Prioritisation Project followed on from the work done to identify the Biodiversity Network and focuses on addressing the first three objectives of the biodiversity strategy (primary and secondary biodiversity and conservation of freshwater aquatic systems). In the context of limited resources being made available to conservation through City budgets and the fact that the City will not be able to purchase or place in formal conservation areas each terrestrial site or river and wetland identified as part of the Biodiversity Network, the city will need to direct its resources to areas of highest biodiversity conservation priority and find innovative and cooperative ways of securing the Network. As implementation will take place over time, land-use planning for areas making up the network has to be guided in such a way that investment is directed to maximize social and economic benefits, facilitate effective conservation and prevent or minimize further loss or damage of important areas of the Network. The process of implementation will need to develop cooperative approaches on land with existing land rights or private ownership. The City therefore undertook a prioritization project to determine where resources had to be directed first and determine land-use guidelines to direct potential investment. The prioritization process has resulted in the identification of three categories of biodiversity priority (A, B, and C). Using GIS modelling to apply various environmental selection criteria, the network has been categorized on the following basis:

- Category A areas are those parts of the network that should be used exclusively for biodiversity conservation purposes and will include amongst others, existing nature reserves and other areas that meet established criteria;
- Category B areas are those areas that are managed for maintenance of biodiversity but which will also support other appropriate activities and land use types;
- Category C areas will be those areas that will fulfil a primary function of supporting an activity or land-use that is mutually inclusive of biodiversity maintenance but not managed primarily as a biodiversity area.

The 'Primary Biodiversity' of the Network refers to all terrestrial and freshwater components of the areas prioritized as A and B or which are defined as 'biodiversity nodes' in the network. 'Secondary Biodiversity' with the Network includes all areas that act as mixed use areas, corridors, links and stepping stones and include all terrestrial and freshwater components that are prioritized as category C and all identified 'biodiversity corridors'.

The different category areas are shown on map 4. The A B and C categories, together with the Metropolitan Open Space System categories (MOSS) have largely influenced the determination of the control zones proposed in this EMF (see section 2).⁷⁹

⁷⁹ Further information on the Biodiversity Network Prioritization Project is documented in a separate report and is not repeated here. Please refer to the City of Cape Town Biodiversity Network Prioritisation Project Final Report, June 2004 which is available from the City of Cape Town Environmental Strategy Directorate.

2. AN OVERVIEW OF OPEN SPACE IN KHAYELITSHA AND MITCHELL'S PLAIN

2.1 Characteristics of open space in Khayelitsha and Mitchell's Plain

There is an urgent need to determine the optimal utilisation of open space in Khayelitsha and Mitchell's Plain. By combining the information derived from the Biodiversity Network Prioritisation project, the Metropolitan Open Space System (MOSS) and the Draft Spatial Development Framework (SDF), guidelines can be obtained which will assist in the assessment of development proposals. A map showing the MOSS and Biodiversity priority areas has been produced. By studying this map some overall observations on the open spaces in Khayelitsha and Mitchell's Plain can be made. These are noted below. This is followed by an outline of some of the key principles (or questions) that need to be considered when any open space is being considered for development. This is followed by some discussion on the proposals for use of open space made in the draft URSDF.

Some broad conclusions that can be drawn from maps 4 and 5 which illustrates the MOSS and Biodiversity Network priority areas are that:

- There are three main areas which receive a category A (highest) biodiversity rating, namely the Macassar dunes, Wolfgat Nature Reserve and parts of the Swartklip site. Only Wolfgat has legal statutory protection. These are large areas of land which receive both 'non negotiable' (MOSS) and high biodiversity priority ratings and which form a major part of the city wide open space structure.
- There is an extensive network of open spaces of varying sizes within Khayelitsha and Mitchell's Plain, most of which have been given a MOSS rating. Most of these open spaces are part of or are linked to the storm water control system. These have been termed 'created green elements' in the URSDF (see URSDF map B1.4). Almost all the open spaces in Khayelitsha receive a high MOSS rating, whereas in Mitchell's Plain, only the bigger pieces of open space receive a high rating.
- With one exception, none of the remaining open spaces in Khayelitsha and Mitchell's Plain receive any biodiversity priority rating. A range of criteria (such as size and connectivity) were used to identify and prioritise the biodiversity nodes in order to achieve the minimum biodiversity targets. The one exception is a small area of dune and strandveld on the Western boundary of Mitchell's Plain which is allocated a B biodiversity priority category.
- There is significant encroachment of both formal and informal development into both 'non negotiable' and 'high' MOSS priority areas. This is resulting in loss of habitat, loss of potential to use open space for recreational and other urban open space purposes as well as significant socio-economic costs associated with people moving into areas subject to flooding and/or erosion. See map 6 (encroachment).

The conclusions drawn from this are that the A and B biodiversity rated areas should not be utilised for urban development, whereas the remaining areas could be developed according to urban need, but retaining some open space and taking the MOSS rating into account as well as a variety of other factors (such as storm water control or aquifer recharge requirements). Open space should thus be part of development.

Where the biodiversity categories A, B and C overlay an area with a MOSS rating, the combination may result in a change in the overall rating. The MOSS ratings are non-negotiable, high, medium and partial. The ratings (non-negotiable) etc are primarily related to the inherent value of a piece of land (rather than its general importance as open space). Non-negotiable MOSS areas tend to be biodiversity, wetland and river corridor areas. At the other end of the spectrum, local pocket parks and the like are medium priority areas. These areas are no less important as an open space category, but they are not usually place bound, meaning any one could be closed, so long as another is opened within reasonable access. The implications of these ratings are that the non-negotiable areas are effectively recommended as no-go areas, whereas the medium priority areas may be negotiated over, so long as the overall (agreed to) ratio of medium priority open space types (such as pocket parks) to number of households / people is not compromised.⁸⁰ Reference should be made to the final component of the Cape Metropolitan Open Space System (CMOSS) mapping project, Phase II, compiled by Chittenden Nicks de Villiers, January 2003 for further information.

The Biodiversity/MOSS overlay map shows agreement between the biodiversity and MOSS ratings in that most of the biodiversity A category areas correspond to MOSS areas with a non-negotiable or high rating. An exception occurs in the south western corner of Mitchell's Plain where areas with a relatively low MOSS rating (Partial MOSS) have been included in the A category area. This therefore elevates the importance of retaining the biodiversity of this affected area.

The non-negotiable MOSS rating reinforces the recognition of the need to maintain an undeveloped coastal corridor, with development only occurring in specified nodes (such as Mnandi and Monwabisi).

3. KEY QUESTIONS THAT NEED TO BE CONSIDERED AND ADDRESSED WHEN DETERMINING APPROPRIATE USES FOR OPEN SPACE

When assessing the use of an open space, there are a series of questions and factors that need to be considered and addressed. These are noted below.

Biological and ecological / biodiversity significance: Does the area fall into a Biodiversity priority area (i.e. an A or B category area)? If so, it is unlikely to be suitable for urban development although managed uses for more generalised open space uses (e.g. passive recreation and education) may be considered. Areas with a C category can be used for a wider variety of purposes, but must still be located and designed to allow for biodiversity conservation. The box below gives an indication of the broad land use types and controls suitable for the A, B and C biodiversity category areas.

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Box 3.1: Land use types and controls suitable for the A, B and C biodiversity

⁸⁰ Pers comm.. K. Hennessy, Planning, City of Cape Town.

category areas

Biodiversity Category A areas

- Restore/maintain as natural landscapes, and prevent land uses that transform these qualities.
- Avoid motorized access and control access on foot.
- Maintain wild, remote and wilderness experiential qualities (practically, this will not be possible in all instances of category A sites, probably at only in the largest sites).
- Promote consolidation of the conservation estate and prohibit further fragmentation (i.e. no sub-division).
- Facilitate co-management arrangements between private landowners and conservation authorities.
- Limited scope for negotiated agreements, preferable to use fiscal incentives (e.g. rates rebate) where limitations sought on existing land use rights.
- Cluster essential structures and facilities, and locate on the periphery of core conservation areas.

Biodiversity Category B areas

- Restore/maintain as natural/semi-natural landscapes.
- Where the spatial orientation allows, use the areas as a buffer to Category A areas.
- Allow limited motorised access and manage non-motorised access.
- Promote land consolidation and minimize further sub-divisions.
- Facilitate co-management arrangements between private landowners and conservation authorities.
- Negotiate agreements with landowners (e.g. transferral of development rights, enhanced development rights at suitable localities in exchange for securing key habitats for conservation purposes, etc), on condition that the conservation worth of the property is not compromised.
- Use fiscal instruments to encourage biodiversity friendly land uses.
- Give consent for land uses that do not compromise environmental standards, subject to positive EIA and compliance with performance standards.

Biodiversity Category C areas

- Maintain as urban transition zones and prevent intrusion of urban land uses.
- Manage form, coverage and intensity of land use to preserve rural character of landscapes.
- Controlled access with restrictions on motorised access to environmentally sensitive areas.
- Promote land consolidation and discourage further sub-divisions.
- Facilitate co-management arrangements between private landowners and conservation authorities for the maintenance of ecological patterns and processes.
- Negotiate land use agreements with landowners that result in the protection of the area's significant environmental attributes.
- Use fiscal instruments to encourage biodiversity friendly land uses.
- Consent use for land uses that do not compromise environmental standards, subject to positive EIA and compliance with performance standards.

1. *MOSS rating*: Does the site have a 'non-negotiable' MOSS rating? If so, it should be subject to development controls similar to those of areas with a category

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A or B biodiversity rating. Areas with a high MOSS rating will be suitable for various types of urban open space (e.g. gardens, parks, initiation sites, ecotourism, environmental education). Areas with a medium or partial MOSS rating would potentially be suitable for more consumptive use of open space (such as sports grounds, urban agriculture).

- | 2. *Whether the site falls on or adjacent to a remnant dune.* Most of the remaining dunes in the Khayelitsha and Mitchell's plain area form part of the MOSS and Biodiversity Network. Reference should be made to the MOSS rating and biodiversity category which should influence choice of land use. Should the area not be captured in the MOSS Biodiversity Network, then an analysis of the value of the dune needs to be done in relation to the other criteria, for example the socio-economic context of the dune (i.e. is it likely to be a resource or a hazard for the adjacent communities) and what, if any, role is it playing in connecting green corridors? Formatted: Bullets and Numbering

- | 3. *The role of the open space in relation to the storm water management system:* Open spaces that play a key role in management of storm water cannot be developed without taking this function into account. Reference should be made to the flood plain management guidelines contained in appendix 2 of this report and the section on hydrology (strategic issue 2, section 4). Formatted: Bullets and Numbering

- | 4. *The position of the site in relation to the most sensitive parts of the Cape Flats aquifer:* Sites which are located above or in close proximity to the most sensitive parts/important parts of the aquifer should not be developed in any way that prevents utilisation of the aquifer. Activities which could pollute the aquifer must be prevented and space needed for the facilities required to extract water from and recharge the aquifer must be left open (refer to map 3 and figures 2.3.1.a) and b). Formatted: Bullets and Numbering
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- | 5. *The vulnerability of the site to flooding and / or erosion:* Open spaces that are vulnerable to flooding should not be developed (refer to map 3.1). Areas subject to erosion (such as dune slopes) are also unsuitable for development unless suitable erosion control methods are used during both construction and operation of the facility. Formatted: Bullets and Numbering

6. *The size, location and accessibility of the open space and its links to existing infrastructure and services as well as how it is being utilised:* Whether the open space is close to or linked to key social facilities such as schools, transport routes, central business areas, sports centres. If so, appropriate investment or management can link the purpose/use of the open space to these facilities, thus integrating them into the urban fabric. Similarly, if the open space is near to a high priority biodiversity or MOSS area, link the sites, either in terms of usage and/or management. If the site is already being informally used for open space or other purposes, this will guide decisions on the most appropriate usage.

- | 7. *Potential for linkages to other open spaces and creation of corridors of open space:* Potential for open spaces which can be linked to or managed as part of other open spaces which, for example, serve a storm water control or biodiversity preservation role should be identified. Opportunities to reinstate linkages to the Formatted: Bullets and Numbering

coast also need to be considered. Some of these opportunities have been identified in the draft URSDF, see map B2.2.

- | 8. *The cultural context and setting of the open space:* Whether the open space has any cultural significance which must be taken into account in determining its use or management (see map 7). Formatted: Bullets and Numbering

- | 9. *The potential of the open space to fulfil economic, educational and cultural needs:* Open space can be used to generate livelihoods / income for local communities e.g. through use for grazing, market gardening. Formatted: Bullets and Numbering

- | 10. *The potential for the site to be made into a safe, managed area, particularly through active community involvement:* Sites that are integrated into the urban and residential fabric will be optimally used, rather than becoming danger zones. Formatted: Bullets and Numbering

Having considered the key questions to be addressed when determining appropriate uses for open space in the urban renewal area, it is also important to ensure that there is harmony with the open space proposals contained in the URSDF. These are discussed below.

4. INTEGRATION OF THE PROPOSALS FOR USE OF OPEN SPACE WITH THE URSDF

The URSDF identifies the problem that most open space remains undeveloped and relates poorly to the surrounding urban environment. It identifies the need to enhance and develop natural assets and provide safe, multi-functional public space. The SDF proposes the development of local parks and sports fields as follows:

- a) the upgrading of open space between the Mandela Park sports complex and the CBD through either sports field development and / or passive recreational space;
- b) Reinforcement of the Harare / Ilitha Park open space link through landscaping supporting the proposed cycle and pedestrian route
- c) Upgrade of the Victoria Mxenge Open Space
- d) Development and upgrade of the Nonkqubela Open Space (east of the station).

Management intervention and planning in the peripheral open spaces should focus on the coastal core areas, particularly managing the interface and activities in the Monwabisi dunes area bordering Wolfgat Nature Reserve and the Macassar Dunes area, the western edge of Mitchell's Plain and the interface with the Phillippi horticultural area and the Khayelitsha Wetlands. The spatial focus of management intervention and planning relating to internal open space should be on areas where the potential exists for facility sharing, the dunes areas in Mitchell's Plain, and new created green precincts.

These proposals are in line with the proposed control zones and management areas in this EMF. However, any detailed plans do need to be developed and evaluated taking the 11 criteria listed in subsection 3 into account. Some of the above areas are under greater pressure or threat than others and should receive priority attention.

The Monwabisi dunes area between Swartklip road and Mew Way is under severe threat as informal settlements are encroaching on this area. This is a category C biodiversity area, meaning that it could be used for a variety of purposes that do not compromise biodiversity. Some of the suggested uses include initiation sites, eco-golf estates, ecotourism or small holdings (see report on Wolfgat-Macassar Node which is described in the following section). A previous strategic study of this area identified opportunities for housing linked to a golf course and golf academy. Consideration should be given to the fact that the Monwabisi dunes are located on limestone, a factor which gives them greater conservation value (see strategic issue 1 in section 3).

The recommended land uses in the URSDF are supplemented by studies undertaken by the City of Cape Town which focus on land uses in the Wolfgat–Macassar Node. These are described below.

5. RECOMMENDED LAND USES AND MANAGEMENT OF THE WOLFGAT – MACASSAR NODE

To inform the establishment of the False Bay component of the Biodiversity network, the City and its partners have identified and evaluated socio-economic opportunities to be realised through biodiversity conservation efforts, as well as plan for their implementation.

The investigation highlighted that to unlock socio-economic benefits it is necessary to:

- secure the land earmarked for the False Bay Biodiversity Network,
- introduce appropriate ‘on the ground’ management, and
- allow communities practical use of conservation land.

By following a community focused approach to securing and managing the False Bay component of Cape Town’s biodiversity network, immediate socio-economic benefits can be realized and the groundwork laid for a range of other benefits to be realised in future.

With an initiative underway to establish the False Bay Ecology Park, the City and its partners prioritised the Wolfgat-Macassar node as their next intervention area. Concept spatial and management frameworks for the Wolfgat-Macassar biodiversity node were developed, with a view towards implementing community focused security and management arrangements. These frameworks serve to align conservation efforts to a common vision, balance conservation and socio-economic development imperatives, inform other planning initiatives, and promote the community’s sustainable use of the biodiversity network.

The concept spatial and management framework⁸¹ produced was based on a rapid review of previous planning studies, interaction with those involved in current planning initiatives and the urban renewal programme, and interviews with other stakeholders involved in the study area.

The key results of the analysis are reproduced (in slightly shortened format) below. Each precinct within the Wolfgat-Macassar node is described, opportunities and constraints identified and recommended land uses specified.

5.1 False Bay Context

The False Bay component of Cape Town's Biodiversity Network links Table Mountain National Park in the west with the Kogelberg Biosphere Reserve in the east, and ties into north-south CMOSS corridors (i.e. Kuils River system and link to Swartklip core botanical site). The City and its partners are working towards securing a functional ecological corridor along the False Bay coastline from west to east. The biodiversity assets included in this strip of coast are listed below. Those that fall within or are immediately adjacent to the Khayelitsha Mitchell's Plain Urban Renewal node are given in bold type.

- Zandvlei Nature Reserve, the catchment of which extends into the TMNP
- Capricorn east core botanical site
- False Bay Ecology Park (comprising Zeekoevlei and Rondevlei Nature Reserves as well as the False Bay waste water treatment works and the landfill site)
- Natural habitat remnants between the suburbs of Pelican Park and Pelican Heights
- **Strandfontein coastal zone (from the Strandfontein resort, along Lukannon Drive, including Blue Waters and up to Mnandi resort)**
- **Wolfgat Nature Reserve**
- **Swartklip dunes**
- **Macassar dunes**
- The Eerste River estuary
- Coastal dunes (Farm 790) which AECI and Sonchem lease from the Department of Public Works
- Lourens river estuary, inclusive of the tern and black oyster catcher breeding colony, and
- Lourens River PNE which extends into the Hottentots Holland Nature Reserve and in turn the Kogelberg biosphere reserve

From a biodiversity conservation perspective the Wolfgat-Macassar node is vitally important as it provides continuity to an ecological corridor along the False Bay coastline and linkages to north-south CMOSS corridors. From an urban renewal perspective the Wolfgat-Macassar node is equally important given the longer term potential of redeveloping Monwabisi into a mixed use waterfront precinct that is integrated with Khayelitsha. The challenge lies in integrating these development and conservation imperatives to create a sustainable development which meets social and economic as well as environmental criteria and needs.

⁸¹ City of Cape Town. Phase 2 report: Wolfgat-Macassar Node: Concept Spatial and Management Framework. June 2005. Report 1418/R2.1. Prepared by Setplan in association with Sonke, Economics and The Nature Conservation Corporation.

5.2 Local Context

Physical threats to the Wolfgat-Macassar biodiversity node include:

- Urban encroachment into the Kuils River floodplain, for example off Macassar Road.
- Parking areas and recreational facilities located within the dynamic coastal zone, the maintenance of which is prohibitively expensive.
- Underutilized amenities and public facilities at Monwabisi, Mnandi and Macassar resorts which contribute to the coastal zone being an unsafe environment for visitors.

There is thus a need to rationalise coastal resorts and reduce operating costs by locating and designing facilities appropriately. A viable and functional coastal node needs to be established which still retains the biodiversity corridor.

5.3 Opportunities, constraints and recommended land uses in the Wolfgat-Macassar node

A concept spatial framework for the Wolfgat - Macassar biodiversity node is illustrated in figure [insert](#) which is reproduced from the Wolfgat-Macassar node report. The spatial framework delineates this so-called 'node' into different precincts, differentiated on the basis of their Category A, B or C biodiversity network classification.

Figure [insert](#) is a spatial framework prepared to guide the realization of the City's biodiversity conservation and socio-economic objectives in the Wolfgat-Macassar area. It is not a spatial development plan for the area. It both responds to and serves to inform the Mitchell's Plain/Khayelitsha urban renewal programme's spatial development framework (SDF) and environmental management framework (EMF). As such it strives to reconcile and align conservation and development imperatives.

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The precincts that make up the Wolfgat-Macassar biodiversity node are illustrated in figure [insert](#) and are presented below. For each precinct the following topics are covered:

- The current status and threats to biodiversity;
- The reasons the precinct has been classified as a Category A, B or C area;
- Potential land uses in the precinct and socio-economic opportunities that could be realized;
- Actions required to realize biodiversity objectives and socio-economic opportunities; and
- Management requirements.

Reference should be made to the Wolfgat-Macassar node report for detailed information on the management requirements.

5.3.1 Wolfgat Nature Reserve

a) Current Status and Biodiversity Threats

Wolfgat is a proclaimed local nature reserve established under Section 7 of the

Western Cape Nature Conservation Laws Amendment Act (2000). It is currently managed by a qualified nature conservator with a student conservator that is under training in their experiential training phase of their studies.

A Reserve Environmental Management Plan has been drafted and approved by the relevant ward committee; however it has yet to be taken to full Council for approval.

An Environmental Education centre has been planned for the area to service the local and regional communities. The proposed location of the Environmental Education Centre is on the northern boundary, adjacent to the Nature Reserve.

Cape Flats Nature (a joint initiative between the City, South African National Biodiversity Institute and The Table Mountain Fund) currently provides the local conservation manager with assistance in the management of the area. This includes accessing funding to cover the staff costs of the conservator, input into the way in which the conservator interacts with the local and regional communities and most importantly capacitating the conservators to managing conservation sites in low income urban areas.

Threats to biodiversity include:

- Baden Powell Drive, which cuts through Wolfgat nature reserve's most sensitive habitats, fragments a core conservation area and opens it up to unrestricted access.
- The urban edge between Mitchell's Plain and Wolfgat nature reserve is poorly defined giving rise to dumping, urban encroachment (land invasion), increased fire risk and ad-hoc footpaths down to the coast.
- The poaching of indigenous fauna as a food source and the removal of flora for the muti trade.
- Invasive alien vegetation has and will for a long time to come pose a huge threat to biodiversity management and this is also the case at Wolfgat.
- Safety and security is a major risk in that it does not directly impact on biodiversity, but does impact on the potential to generate revenue for biodiversity management specifically in the tourist industry.
- Off-road vehicle enthusiasts utilise this area for recreation, causing substantial damage to dunes and other sensitive areas and increasing erosion.
- Illegal sand mining impacts heavily on the site.
- Disruption of avifauna breeding sites due to poaching of eggs and chicks as well as the sites close proximity to favored fishing sites.
- Adhoc roadside parking and informal cliff access.

b) Biodiversity Network Classification

As a formal protected area Wolfgat Nature Reserve is classified as a Category A area in Cape Town's biodiversity network.

c) Potential Land Use and Socio-economic Opportunities

Wolfgat should be actively managed as a core conservation area that is subject to low intensity human activities such as environmental education, walking trails, and recreational fishing. The new environmental center will serve as base for schools

education programmes and can be a catalyst for strengthening ties with the local community. Besides the educational and recreational benefits that the reserve provides, other economic opportunities that Wolfgat presents include:

- contract work to clear alien vegetation,
- maintain fire belts and build footpaths;
- recycling, craft sales and tour guides operating from the environmental center;
- the sustainable harvesting of medicinal plants; and
- the creation of a fynbos nursery.

There is scope to extend the community based Dagbreek dunes initiative⁸² in Wolfgat, inclusive of partnering with neighbourhood watch organizations to address local security issues.

d) Implementation Actions

Wolfgat has a draft management plan in place. The new environmental education center is the principal new capital project underway, and a programme is in place to oversee its implementation.

From a biodiversity conservation perspective maintaining the integrity of Wolfgat as a nature reserve is dependent on the realignment of Baden Powell Drive away from the coastline to the Mitchell's Plain urban edge. This will clearly delineate the reserve's northern boundary, allow for controlled vehicular access into the reserve, permit use of the old road alignment as an internal management track, contain parking in eastern and western parking areas, and assist in the rationalization of footpaths from the parking areas and the proposed new environmental center. Furthermore the realization of the socio-economic opportunities is dependent on adequate but appropriate access.

5.3.2 *Monwabisi/Swartklip Dunes*⁸³

a) Current Status and Biodiversity Threats

Monwabisi dunes, immediately east of Wolfgat, is a strategic precinct in the biodiversity network as it provides east-west continuity to the coastal biodiversity network and links with the CMOSS corridor extending up to the Swartklip core botanical site. The property, approximately 173 hectares in extent, is owned by the City of Cape Town and is zoned Open Space 1 but is not actively managed as a conservation area.

Threats to biodiversity here include:

- Informal settlement encroachment along Khayelitsha's southern boundary (i.e. in the Harare, Kuyasa and Monwabisi Park areas) extends south of Mew Way into the Monwabisi dunes.

⁸² This is an initiative initiated by the local community to involve children and local community members in informing tourists about the Dagbreek dune and adjacent area.

⁸³ In the Wolfgat-Macassar Node report, these dunes are referred to as the Swartklip dunes. In this report they are referred to as the Monwabisi/Swartklip dunes so as to distinguish them from the dunes further inland on the Swartklip site.

- The poaching of indigenous fauna as a food source and the removal of flora for the muti trade.
- Invasive alien vegetation has and will for a long time to come pose a huge threat to biodiversity management.
- Safety and security is a major risk in that it does not directly impact on biodiversity, but does impact on the potential to generate revenue for biodiversity management specifically in the tourist industry.
- Off-road vehicle enthusiasts utilize this area for recreation, causing substantial damage to flora and increasing erosion.
- Illegal sand mining and dumping impacts heavily on the site.
- Adhoc pedestrian movement impact given limited linkages between Khayelitsha and the coastal zone.

b) Biodiversity Network Classification

Monwabisi/Swartklip dunes is categorized as a category C area in Cape Town's biodiversity network. This area fulfills a vital linkage function in terms of the continuity of the biodiversity network. These dunes are situated on limestone which affects the vegetation types that grow on the dunes. These dunes are considered to be more sensitive to disturbance than other similar parabolic dunes along the coast for this reason (see section 3 of this report).

c) Potential Land Use and Socio-economic Opportunities

The Biodiversity Network Prioritisation project notes that where a category C biodiversity area lies on top of a MOSS non-negotiable area, development should be discouraged. However, the document also notes that the socio-economic local context must also have a bearing on what land uses are appropriate. Sustaining this strategic land parcel as part of the conservation estate lies in it being of practical use to the impoverished neighbouring communities and forming an edge to prevent further encroachment. Suitable community uses of the land include the controlled harvesting of natural resources, indigenous nurseries and small scale organic farming ventures, initiation villages, outdoor recreation, environmental education and tourism facilities (given proximity to the look-out dune facility).

The botanically significant natural habitat remnant immediately east of Wolfgat (i.e. land parcel bounded by the realigned Steve Biko Drive in the west, Swartklip Road in the south, Oscar Mpetha Road in the east, and a formalized Harare urban edge in the north) is suitable as a multi-purpose nature area that is actively used by neighbouring communities. Effectively it is suitable as an eastern extension of Wolfgat, but should be managed as a 'community' natural resource use area. There is scope for suitable portions of the property to be used as initiation villages, plant harvesting areas, nurseries, as well as active and passive recreation.

Proposed expansion of cemetery

The City is planning to extend the cemetery in the northern portions of this precinct and is incorporating biodiversity conservation principles into the design. The fact that the cemetery is located on top of the most valuable part of the aquifer is however a factor that needs to be taken into account and an environmental impact assessment

will be essential to determine the significance of potential impacts.

d) Implementation Actions

To secure this part of the network the priority is to formalize and maintain a functional urban edge along the interface with Harare, and allocate management responsibility for the portion falling outside the urban edge. The City should retain ownership of this land and not cadastrally fragment the property. Wolfgat's management team should be assigned responsibility for actively managing the conservation portions on the precinct.

A detailed precinct assessment is necessary to accurately determined which portions need to be retained as conservation land and what can be used for initiation villages and other uses.

5.3.3 Precinct between Monwabisi and Khayelitsha

a) Current Status and Biodiversity Threats

The precinct is owned by the City and is zoned Open Space 1, but is not actively managed as a conservation area. The City's Special Project Directorate has a planning initiative underway to appropriately develop this property to integrate Khayelitsha with the coast. This initiative will require authorization in terms of the EIA regulations due to the change of land use.

b) Biodiversity Network Classification

Although the precinct was not prioritized in the City's biodiversity network classification, it remains an area of biodiversity significance falling within the coastal zone and providing east – west continuity to the False Bay component of the network. The precinct falls within the category C area (i.e. multi-use area within which biodiversity conservation principles are applied).

c) Potential Land Use and Socio-economic Opportunities

This strategic land parcel needs to accommodate the physical integration of Khayelitsha with Monwabisi, without compromising the continuity of the biodiversity network. The Monwabisi SDF recommendations are consistent with these dual development and conservation requirements. Feasible land uses here that can be designed to be compatible with biodiversity conservation include residential and/or golf estates, a lodge and conference center, and day visitor recreation and picnic facilities on the parcel of land between Beach Road and Baden Powell Drive. A previous strategic study of this area identified opportunities for housing linked to a golf course and golf academy. An east-west biological corridor, at least 200m wide, needs to be incorporated into the precinct's development as its primary structuring element.

The development of this mixed-use precinct can open up a range of new job and income earning opportunities for local communities with the biodiversity network demonstrating its contribution to place making and the generation of sustainable

livelihoods.

The proposed redevelopment of Monwabisi from an underutilized seasonal beach resort into Khayelitsha's mixed use waterfront precinct has the potential to open up significant new economic opportunities, and make the area more enjoyable and safe to visit. Concentrating high intensity use within the Monwabisi precinct will take pressure off more sensitive parts of the biodiversity network.

d) Implementation Actions

The Environmental Planning department should give support to redevelopment of the node. An environmental impact assessment will be necessary as resorts are a listed activity in terms of the EIA regulations. Where possible, biodiversity conservation principles should be adopted in the urban design.

(Note: Other areas covered in the Wolfgat-Macassar node report are not covered here as they fall outside the urban renewal study area).

6. URBAN RENEWAL AREAS OF CONFLICT AND TRANSITION THAT NEED PRIORITY ATTENTION

The areas needing priority attention in terms of retention of biodiversity and open space are:

- the Monwabisi/Swartklip dunes between Mew Way and Swartklip Road (north east of Wolfgat Nature Reserve) (under pressure from informal settlement encroachment).
- The remnant dunes on the Western boundary of Mitchell's plain, which receive a combined MOSS/biodiversity category A rating (also under development pressure).
- The Khayelitsha and Kuils river wetlands.

The key areas needing both strategic and detailed planning are the Swartklip site and the coastal nodes (Monwabisi, Mnandi, Kapteinsklip). Development of these areas should be geared to retention of their biodiversity value and creation of socio-economic opportunities. The coastal resort nodes of Monwabisi, Mnandi and Kapteinsklip (future) should, as stated in the URSDF, aim to link the communities with the coast, but be designed in such a way as to maintain the east west coastal 'green' corridor.

7. AREAS WITH THE GREATEST POTENTIAL FOR DEVELOPMENT OF HOUSING

Between November 2003 and April 2004 four students studying for their Master of Philosophy in Environmental Management at the University of Cape Town undertook an investigation into the open spaces within Khayelitsha with a view to determining their environmental sensitivity and developmental potential. The study was undertaken on behalf of the Environmental Planning Division of Tygerberg municipality. The study identified the main areas most suitable for housing. The

findings of this study have been checked against the SDF proposals and the information obtained during the course of the EMF. There are no apparent conflicts in the proposals made in this study, the EMF and the SDF proposals. The key findings and recommendations of the Khayelitsha open space situation assessment are summarised in Table 7.1 below. Reference should be made to the study for details on the opportunities and constraints posed by each of the open space areas listed in the table.

Table 7.1: Development potential of open spaces in Khayelitsha

Site	Main Constraints	Overall suitability
Victoria Mxenge Open Space System	<ul style="list-style-type: none"> ▪ Stormwater function ▪ Only open space in Victoria Mxenge ▪ Proposed MOSS site ▪ Part of green corridor 	<ul style="list-style-type: none"> ▪ Suitable to support mix of development and open space
Pama/Sithela Roads Wetland	<ul style="list-style-type: none"> ▪ Relatively small site (1.3 ha) ▪ Stormwater function ▪ Only open space in vicinity ▪ Proposed MOSS site 	<ul style="list-style-type: none"> ▪ Least suitable site for urban development. Ecological significance due to wetland. Plays an important role in storm water management. ▪ Too small to support mix of development and open space, should be retained as open space. Site has valuable outdoor education potential
Kusasa Road Wetland	<ul style="list-style-type: none"> ▪ Stormwater function ▪ Proposed MOSS site ▪ Part of green corridor 	<ul style="list-style-type: none"> ▪ Parts of the site suitable to support mix of development and open space
Silumko Open Space System	<ul style="list-style-type: none"> ▪ Part of green corridor 	<ul style="list-style-type: none"> ▪ Most suitable site for development, no significant constraints. Need to retain storm water management role.
Lingelethu West	<ul style="list-style-type: none"> ▪ Stormwater function ▪ Partially recommended for MOSS 	<ul style="list-style-type: none"> ▪ Suitable to support mix of development and open space
Mew Way/Spine Road Open Space System	<ul style="list-style-type: none"> ▪ Proposed MOSS site ▪ Part of green corridor ▪ Contains rare plants ▪ Outside urban fabric ▪ Landfill site requires a buffer area (approximately 800m) around it. 	<ul style="list-style-type: none"> ▪ Large parts unsuitable for development as site contains rare plants. Some limited development possible along Mew Way where development has already taken place. Higher order facilities should preferably be located in Ilitha Park.
Ilitha Park/Harare Open Space System	<ul style="list-style-type: none"> ▪ Storm water function ▪ Only open space in Harare ▪ Proposed MOSS site ▪ Part of green corridor ▪ Elongated open space, in parts very narrow 	<ul style="list-style-type: none"> ▪ Partly suitable – Wider areas suitable to support mix of development and open space ▪ Narrower parts too small to accommodate mix, should be retained as open space
Oscar Mpetha/Ntlazane	<ul style="list-style-type: none"> ▪ Only open space in Kuyasa 	<ul style="list-style-type: none"> ▪ Suitable to support mix of development and open space

	<ul style="list-style-type: none"> ▪ Proposed MOSS site ▪ Part of green corridor 	
Lansdowne/Cekeka Roads Open Space	<ul style="list-style-type: none"> ▪ Only open space in vicinity ▪ Proposed MOSS site 	<ul style="list-style-type: none"> ▪ Suitable to support mix of development and open space. Mixed use must include small well defined open spaces
Steve Tshwete Open Space System	<ul style="list-style-type: none"> ▪ Few other open space in vicinity ▪ Proposed MOSS site 	<ul style="list-style-type: none"> ▪ Suitable to support mix of development and open space. Potential to enhance existing urban agriculture initiative.

Unfortunately a similar study for Mitchell's Plain has not been carried out and is outside the resources of this stage of the EMF. However, the type of analysis carried out for the Khayelitsha open spaces is also applicable for the Mitchell's Plain open spaces. Consideration of the 11 criteria (given in subsection 3) to be taken into account in assessing development applications should reveal the desirability and suitability of the site for development

SECTION SIX
STRATEGIC ISSUE: AIR AND WATER
QUALITY

6. SECTION SIX

STRATEGIC ISSUE: AIR AND WATER QUALITY

1 INTRODUCTION

This section provides a brief description of the air and water quality situation in Khayelitsha and Mitchell's Plain. The main purpose of providing this information is to alert project proposers to pollution problems in order that any constraints posed by the pollution may be taken into account in project conceptualization and design. Similarly, any projects that can help to address the air and water pollution problems are to be welcomed.

Statement of strategic issue: Developments can both cause and be affected by pollution. Pollution affects the natural, cultural and socio-economic environments. Pollution of natural environments (air, soil, and water) reduces their resource and aesthetic value. Air, water and soil pollution can all affect human health, particularly those who are vulnerable such as children and the very old. This is particularly applicable in Khayelitsha where high particulate levels, due primarily to the burning of wood, are causing a high incidence of respiratory disease. Noise pollution also has negative impacts on quality of life. Health problems related to pollution affect people's quality of life and ability to contribute to the economy. It is thus important to prevent pollution wherever possible, and where it cannot be entirely prevented, minimize it to levels which fall within world health standards.

2 OVERVIEW OF AIR AND WATER QUALITY SITUATION IN KHAYELITSHA AND MITCHELL'S PLAIN

2.1 Air Pollution

Understanding of the air pollution situation in an area can assist with the identification of means to address air pollution and the related health problems. The City of Cape Town has recently updated the air quality situation assessment for the city. All of the air quality information for this section of the EMF has been extracted from the situation assessment⁸⁴.

The City of Cape Town has an ambient air quality monitoring network comprising about 11 monitoring stations throughout the CCT. The parameters recorded are shown in the table below. The location of the Khayelitsha monitoring station is

⁸⁴ Updated air quality situation assessment for the City of Cape Town. August 2004. Report No. APP/04/CCT-02. Prepared by Airshed Planning Professionals (Pty) Ltd

shown on map [insert](#) (opportunities and constraints map).

Table 2.1.1 Parameters recorded and duration of monitoring for Khayelitsha air quality monitoring network station

Station Name:	Parameters Measured:	Initiation of Monitoring
Khayelitsha	PM10 ⁸⁵ SO ₂ O ₃ NO, NO _x , NO ₂	March 1999 Monitoring initiated early 2001 May 2004 June 2004

For the purpose of assessing the extent of data availability and determining the acceptability of pollution levels given local and international air quality guidelines/standards, the compilers of the updated air quality situation assessment made reference to data collected for the period January 2000 to December 2003.

The percentage data availability for the total period assessed for Khayelitsha is shown below.

Table 2.1.2: Percentage of air quality monitoring data availability for CCT during 2000

Station: Khayelitsha	Percentage Data Available for 2000					
	SO ₂	NO ₂	PM10	O ₃	CO	H ₂ S
			84.6			84.6
	Percentage Data Available for 2001					
	56.07		20.81			
	Percentage Data Available for 2002					
	70.76		57.67			
	Percentage Data Available for 2003					
	91.52		96.67			
	Annual Average Data Availability for the Total Period Being Assessed					
	72.78		64.94			

The Air Pollution Monitoring and Control section of the City has indicated that it has as a key performance indicator a 90% data availability. Based on the information

⁸⁵ PM10 = Particulates
 SO₂ = Sulphur dioxide
 NO₂ = Nitrogen dioxide
 O₃ = Ozone
 H₂S = Hydrogen sulphide

presented in Table 2.1.2 the monitoring station at Khayelitsha consistently falls below this target value up to 2002. It is therefore expected that plans will continue to be put in place by this section to improve data recovery levels for this station not currently meeting this target.

In Khayelitsha, which experiences consistently high levels of pollution, the main problem pollutant is particulates (measured as PM10)⁸⁶.

It was found that there were large spatial variations in airborne particulate concentrations, with Khayelitsha experiencing, on average, concentrations almost double those recorded at the City/Drill Hall and Bothasig sites.

Sources of pollution in Cape Town that were found to be significant in terms of their contributions to ambient air pollutant concentrations and associated health risks include:

- a) Household fuel burning, particularly wood and to a lesser extent paraffin and coal. Wood burning is a very significant contributor to fine particulate concentrations.
- b) Industrial and commercial fuel burning, particularly poorly controlled Heavy Fuel Oil and coal fired boilers and wood waste combustion.
- c) Vehicle exhaust emissions, both petrol and diesel
- d) Air traffic.

Localized sources of pollution include tyre burning and informal refuse burning, both relevant in Khayelitsha, and to a lesser extent, Mitchell's Plain. Tyres are burned in Cape Town for both space heating purposes and scrap metal recovery. Particulates released during tyre burning have been found to be composed of aluminium, silicon, iron and organic and elemental carbon.

Priority areas for pollution were identified as household fuel burning areas (such as Khayelitsha), the central business district and residential areas transected by highways, on ramps and main feeder roads, residential areas in close proximity to industrial areas such as Bellville South Industrial area and the Caltex refinery and residential areas in close proximity to Cape Town International Airport.

A synopsis of pollutants, contributing sources and key impacts areas is presented in table 2.1.3 below.

⁸⁶ PM10 has significant health effects, contributing to respiratory ailments in particular.

Table 2.1.3: Pollutants, contributing sources and key impact areas

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Pollutants	Main Contributing Sources	Key Impacted Areas
PM10, PM2.5	<ul style="list-style-type: none"> - Transport (primarily diesel vehicle emissions) - Industrial (coal combustion contribution notable) - Household fuel combustion (notable given high exposures) - Other sources (primarily wild fires, tyre burning - significant in terms of episodes) 	Elevated concentrations over much of the CCT resulting in widespread health risks, with significant health effects anticipated in residential fuel burning areas (e.g. Khayelitsha).
NO ₂	<ul style="list-style-type: none"> - Transport (petrol vehicles, diesel vehicles then airports and port activities) - Industrial processes (specifically gas burning appliances) - Household fuel combustion - Wild fires, tyre burning, etc. as minor sources 	Notably elevated concentrations (likely non-compliance events) within the city centre
Ozone	<ul style="list-style-type: none"> - Secondary pollutant associated with NO_x and other precursors releases - Transport (petrol vehicles as key contributor, also diesel vehicles, airports, port activities) - Household fuel combustion - Industrial processes - Wildfires 	Large spatial variations in concentrations noted during monitoring. Due to this being a secondary pollutant, the identification of key impact zones require further monitoring and/or modelling
SO ₂	<ul style="list-style-type: none"> - Industrial sector (particularly due to HFO combustion) - Transport (diesel vehicles, petrol vehicles, port operations) - Household fuel combustion - Tyre burning, wild fires 	Relatively small spatial variations in concentrations apparent, with elevated levels occurring at all sampling locations
VOCs	<ul style="list-style-type: none"> - Transport (petrol vehicles as key contributor, also diesel vehicles, airports, port activities) - Household fuel combustion - Industrial processes - Wildfires 	Main impact zones to be established following additional monitoring and modelling efforts
CO	<ul style="list-style-type: none"> - Transport - Industrial processes - Household fuel combustion - Wild fires, tyre burning 	Notably elevated concentrations (likely non-compliance events) within the city centre
Air Toxics	Incinerators, landfill operations, specific industries (refinery, printers, dyers, etc.)	In close vicinity to sources

Khayelitsha is located in a low lying area and seems to be particularly vulnerable to accumulation of pollutants. The most significant pollutant appears to be PM 10, the particulate emissions, the most significant source being household fuel burning (19.8%), followed by vehicle emissions (18%), and industrial, commercial and institutional fuel burning (11.5%). Biomass burning and tyre burning are anticipated to be a significant episodic source of fine particulate emissions, accounting for 4.5 % and 3.8% of fine particulate emissions respectively.

The low dispersion potential in Khayelitsha thus makes it an area highly unsuitable for industrial activities which would further contribute to PM10, sulphur dioxide or nitrogen dioxide.

The proposed South African limit for highest daily PM10 concentrations (75 µg/m³) was exceeded at all stations, with the exception of City Hall, during 2001. This limit was exceeded at all stations for which data were available, with the exception of Bothasig during 2003. The proposed SA annual PM10 limit (40 µg/m³) was however only exceeded at Khayelitsha. The UK limit for daily averages (50 µg/m³) was exceeded at all stations during all years.

Table 2.1.4: Pollutants measured to have exceeded guideline values at specific stations (grey shading indicates pollutant is monitored at the station; cross indicates occurrences of guideline exceedances)

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Station	PM10	SO ₂	NO ₂	O ₃	CO	H ₂ S
Athlone			✘	✘		
Bellville South	✘					
Bothasig	✘	✘	✘			✘
City Centre/Drill Hall	✘		✘	✘		
Goodwood	✘		✘	✘		
Khayelitsha	✘					
Killarney	✘	✘				
Oranjezicht				✘		
Table View	✘					✘
Vissershok				✘		

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The number of ‘moderate’, ‘high’ and ‘very high’ pollution days occurring due to PM10 concentrations, based on the UK banding system are given in Table 2.1.5. All stations experienced infrequent ‘moderate’, ‘high’ and ‘very high’ pollution days indicating that the potential for health risks due to exposures to airborne particulate concentrations is widespread across the CCT.

Increases in PM10 concentrations were evident at Bellville South and Table View. PM10 concentrations remained largely unchanged at Bothasig, City Centre and

Goodwood during the 2001 to 2003 period. At Khayelitsha a decrease in the percentage of “very high” pollution days was noted to occur. However, at this site there was an increase in the number of “moderate” and “high” days and a reduction in the number of “low” pollution days.

Table 2.1.5: Number of 'moderate', 'high' and 'very high' pollution days occurring within CCT during 2001, 2002 and 2003, based on UK bands given for PM10

Station	Band	Number of Days in Each Band			Percentage of Days in Each Band		
		2001	2002	2003	2001	2002	2003
Bellville South	"Very High"	0		6	0.0		2.8
	"High"	3		9	1.6		4.2
	"Moderate"	14		15	7.4		7.0
	"Low"	171		184	91.0		86.0
Bothasig	"Very High"	2	0	0	0.6	0.0	0.0
	"High"	0	1	0	0.0	0.3	0.0
	"Moderate"	7	3	7	2.1	1.0	3.9
	"Low"	328	296	171	97.3	98.7	96.1
Khayelitsha	"Very High"	9	9	23	11.8	4.3	6.5
	"High"	1	9	12	1.3	4.3	3.4
	"Moderate"	4	25	50	5.3	11.8	14.1
	"Low"	62	168	269	81.6	79.6	76.0
City Centre	"Very High"	1	0	0	0.3	0.0	0.0
	"High"	2	1	1	0.6	0.3	0.3
	"Moderate"	7	13	10	1.9	3.6	2.8
	"Low"	352	348	351	97.2	96.1	97.0
Goodwood	"Very High"	2	3	2	0.5	0.8	0.6
	"High"	6	3	4	1.6	0.8	1.1
	"Moderate"	16	24	18	4.4	6.7	5.0
	"Low"	340	326	336	93.4	91.6	93.3
Table View	"Very High"	2	0	0	0.6	0.0	0.0
	"High"	0	1	5	0.0	0.3	1.4
	"Moderate"	10	11	29	2.8	3.1	8.0
	"Low"	341	339	329	96.6	96.6	90.6

"Very high" > 100 µg/m³; "High" 75 - 100µg/m³; "Moderate" 50 – 75 µg/m³; "Low" < 50 µg/m³

The number of episode days recorded at each station during the 2000 to 2003 period and the pollutants responsible for such days is given in Table 2.1.6.

Table 2.1.6: Number of 'episode days' recorded at each station during the 2000 to 2003 period and the pollutants responsible

SOURCE	Number of 'Episode Days' ^(a)			
	2000	2001	2002	2003
Athlone		2 (1 due to O ₃ , 1 due to NO ₂)	1 (due to O ₃)	5 (1 due to O ₃ , 4 due to NO ₂)
Belville South		13 (pm10)		27 (due to PM10)
Bothasig	2 (1 due to SO ₂ , 1 due to NO ₂)	8 (4 due to pm10, 2 due to NO ₂ , 2 due to H ₂ S)	8 (3 due to PM10, 1 due to NO ₂ , 4 due to H ₂ S)	38 (5 due to PM10, 5 due to NO ₂ , 28 due to H ₂ S)
City/Drill Hall	17 (10 due to NO ₂ , 7 due to PM10)	12 (9 due to PM10, 3 due to NO ₂)	14 (11 due to PM10, 3 due to NO ₂)	39 (11 due to PM10, 28 due to NO ₂)
Goodwood	41 (1 due to NO ₂ , 4 due to O ₃ , 36 due to PM10)	27 (21 due to PM10, 1 due to O ₃ , 5 due to NO ₂)	20 (due to PM10)	20 (due to PM10)
Khayelitsha	52 (due to PM10)	29 (due to PM10)	86 (due to PM10)	137 (due to PM10)
Killarney			14 (3 due to SO ₂ , 11 due to PM10)	
Oranjezicht	1 (due to O ₃)			
Tableview	7 (due to PM10)	11 (due to PM10)	28 (due to PM10)	59 (28 due to PM10, 31 due to H ₂ S)

Notes: ^(a) An 'episode day' is defined for the purpose of this study as a day on which an exceedance of international best practice guideline values or threshold limits occurred.

The number of episode days increased at Bothasig, City Hall/Drill Hall, Khayelitsha and Table View during the 2000 to 2003 period, whilst reducing at Goodwood.

Table 2.1.7: AIR POLLUTION CONTROL - MONTHLY AIR QUALITY REPORT JANUARY - DECEMBER 2004

SUMMARY OF AIR POLLUTION EPISODES

THERE WERE 103 DAYS ON WHICH THE AIR POLLUTION EPISODES EXCEEDED THE CITY OF CAPE TOWN STATE OF ENVIRONMENT AIR QUALITY GUIDELINES

AIR QUALITY MONITORING SITES	HEALTH DISTRICT	SUB - COUNCIL	Particulates (PM-10)			Nitrogen Dioxide			Sulphur Dioxide			Carbon Monoxide			Ozone			Pollen	Mould
			M	H	VH	M	H	VH	M	H	VH	M	H	VH	M	H	VH		
Area	H/D	S/C															*	*	
Somerset West	H	1																	
Bothasig	A	2	0	0	0	4	0	0	5	0	0	0	0	0	0	0	0	0	0
Platteklouf			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Table View	A	2	18	4	1	2	0	0	6	0	0	0	0	0	0	0	0	0	40
Central CT	B	5	13	1	0	24	0	0	0	0	0	10	0	0	0	0	0	0	0
Red Cross	B	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Athlone	D	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Khayelitsha	G	13	72	11	5	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Bellville South			10	3	0	0	0	0	7	0	1	0	0	0	0	0	0	0	0
Goodwood	F	15	19	4	0	5	0	0	3	0	0	1	0	0	1	0	0	0	0
Parow	F	15	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Vissershok			0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

LEGEND

Pollutants not measured

M = Moderate

Comment:

See individual months.

H = High

VH = Very High

DESCRIPTION

Pollutants (PM10, NO₂, SO₂, CO, O₃)

The City of Cape Town has adopted the UK Standards as in the form of a Banding System as guidelines in the State of Environment Report. The Banding System progress through 4 stages: low, moderate, high, very high. Low is when the air quality readings are

* **Pollen and Moulds** - Number of days the internationally guidelines (where sensitised persons may be affected) were exceeded.

PM10 represents the most significant criteria pollutant in terms of human health risk potentials within the CCT. Elevated PM10 concentrations occur over much of the CCT resulting in widespread health risks, with significant health effects anticipated in particular areas (e.g. Khayelitsha).

In 2004, a NEDLAC ‘Dirty Fuels’ study was undertaken which predicted human health impacts due to fuel usage. The contribution of the various source groupings to total direct health costs is shown in the figure 2.1.1 below.

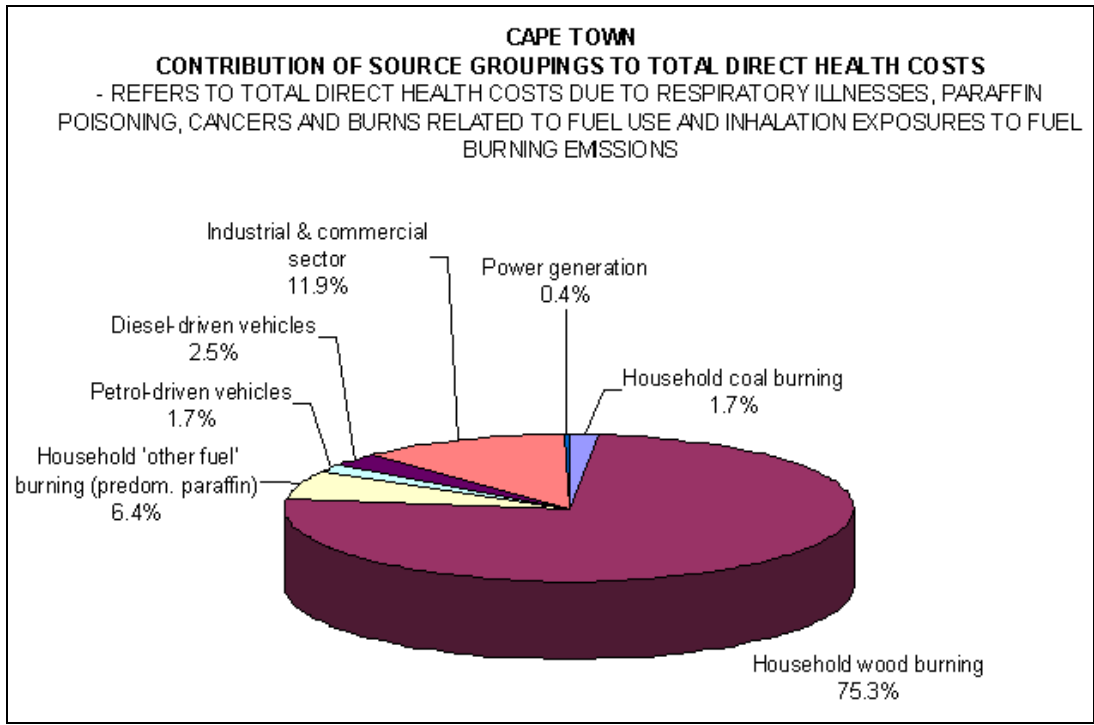


Figure 2.1.1: Contribution of source groupings to total direct health costs estimated to occur due to fuel use and inhalation exposures to fuel burning emissions. (Note: Unrepresentative spatial distributions of vehicle emissions during the dispersion simulations may have resulted in the underestimation of health impact related to this source grouping).

The study concluded that approximately 80% of the respiratory ailments resulting in increased hospitalization and health care visits was predicted to be due to domestic wood burning, with domestic coal burning only responsible for 2%. Inhalation exposures to fuel burning emissions were predicted to be responsible for 23% of respiratory hospital emissions and 26% of all chronic bronchitis cases. Although domestic fuel burning was estimated to have contributed only 3% of the emissions, it was predicted to account for 82% of the health costs due to inhalation-related health effects. The low level of emissions, the coincidence of peak emissions with periods

of poor atmospheric dispersion (i.e. night time, winter time) and the release of such emissions within high human exposure areas exacerbate the situation.

The study indicated that measures aimed at reducing inhalable and respirable particulate emissions would be most effective if the following sources were targeted:

- household fuel combustion,
- diesel vehicle emissions,
- vehicle entrainment, and
- coal combustion within the industrial and commercial sectors.

This means that any initiatives to reduce use of wood burning (and to a lesser extent coal), would have major benefits for the people of Khayelitsha. Electrification, using both conventional and alternative sources, as well as projects which encourage use of less polluting sources (such as solar, gas and paraffin) should be a significant component of urban renewal projects.

2.2 Air pollution associated with waste disposal

In the past, studies dealing with the environmental impact of waste disposal facilities in South Africa, have largely focused on water contamination due to leachate from landfills. There is, however, currently growing public concern about the health implications of landfill gas emissions. Nuisance impacts related to the occurrence of malodours near landfill operations remains a large source of public complaints and outrage. (The potential for dust-fall impacts is relatively small compared to other activities, such as mining and agricultural tilling.) An emissions data base for landfill operations should include emissions of toxic and odorous gases in addition to fugitive dust emissions in order to adequately facilitate the assessment of human health and welfare impacts related to such operations.

The Department of Water Affairs and Forestry is primarily responsible for the licensing of landfill operations, but operational management is the responsibility of local authorities. Local health authorities are responsible for small-scale general landfills that receive municipal waste. The National Waste Management Strategy has recently increased the responsibility of provincial authorities with regard to the management of impacts associated with waste disposal sites.

The location of landfills within the CCT is shown below. The Swartklip site is located directly between Khayelitsha and Mitchell's Plain.



Figure 2.2.1: Location of landfills within the CCT (after CMC Waste Management, September 2001, <http://www.cmc.gov.za/w&w>).

Landfill gas emissions and fugitive dust emissions represent the main aspects related to landfill operations. Sources of fugitive dust emissions include: vehicle-entrained dust from paved and unpaved roads, materials handling operations (e.g. waste movement, compaction and tipping operations), wind erosion of open areas and soil cover, and vehicle activity on the landfill site, including general vehicle traffic (tractors, trucks, etc.) and earthmoving activities. Such particulate emissions present a health hazard since they may have adsorbed molecules of toxic substances.

Landfill gases of concern associated with the general or co-disposal landfill options include a range of odiferous and toxic gases. Landfill gas usually contains between 40% and 60% methane and similar percentages of carbon dioxide. Methane is one of the gases which makes a significant contribution to climate change. Other gases constitute only a small fraction of the total gas, and include both inorganic products and a large number of organic compounds. Studies indicate that up to 200 compounds can be encountered in a landfill site.

Air quality impact assessment conducted for large hazardous and general landfill sites in South Africa (including the CCT and privately operated waste sites at Visserhok) have generally indicated that:

- significant health risks, given good landfill facility management, are restricted to within 500 m of the landfill boundary;
- odour impact distances can vary from 200 m to 5 km depending on facility management; and
- nuisance dust impacts are generally restricted to within the immediate boundary of the facility.

Given the range of pollutants emitted from landfill operations (and the difficulties in controlling emissions at sites with histories of poor management) it is recommended that landfill sites be classified as possible “toxic hotspots” for air quality management purposes. **A general guideline applied by the CCT is that an 800 meter buffer zone should extend around all landfill operations.**

The Swartklip landfill site has recently been closed, but will have to continue being monitored indefinitely.

Waste water treatment works also release volatile organic compounds (VOCs) during wastewater treatment. There is no conclusive evidence that human health is seriously affected by odour but odours are a source of annoyance and discomfort to the local community and can affect property values and development.

Incinerators operating with the CCT are of importance given the toxicity of their emissions. In the absence of sufficient emissions data, it is recommendable that such operations be treated as “*toxic hotspots*” for air quality management planning purposes. Landfills and waste water treatment works are similarly associated with a wide range of odiferous and toxic emissions and therefore require close attention by air pollution authorities.

Any planning for Khayelitsha and Mitchell’s Plain, which involves housing or other urban facilities, will thus need to, as far as possible, allow for buffer zones between urban areas and landfill or wastewater treatment sites and incinerators.

2.3 Water pollution

The main river system that borders on the study area is the Kuils River. It flows past the north eastern edge of Khayelitsha. According to the City of Cape Town Catchment, Stormwater and River Management report for 2003 – 2004, the quality of the river water is generally unacceptable and is unsuitable for intermediate contact recreation. High *Escherichia coli* levels (10 000 – 100 000 *E coli* per 100 ml median value) make it unsuitable for any form of human contact. There are 10 sampling

points on the Eerste and Kuils rivers and they show only a 30% compliance with DWAF guidelines for *E coli*. Total phosphorus levels are also high. These pollutants originate from domestic and industrial effluents, sewage, detergents and fertilizers. High *E coli* levels can cause a variety of human diseases, and high phosphorus levels can trigger nuisance growth of plants and blooms of potentially toxic 'blue-green algae'. The Kuils river MOSS study (September 1999), also found that the river is not suitable for domestic use, irrigation and full and intermediate contact recreation. It can however be used for cattle watering, and irrigation of fodder and grass, nurseries, sports fields and lawns providing there is limited contact with the water. The use of the river water for cattle watering is however risky, particularly in summer and prior scanning of samples to determine the species of pathogens present is recommended, particularly for young livestock and poultry.

Litter is a serious problem in much of the study area, including the Khayelitsha wetlands. Detention ponds and other storm water channels tend to trap wind blown litter, which then clogs the system, contributing to localized flooding. Stormwater systems also tend to be treated as waste disposal areas or toilet areas by people from informal settlements when these services are not adequately supplied. Despite the filth, children are attracted to water areas and can frequently be seen playing in very unhygienic environments. Both solid and liquid waste contribute to the degradation of water quality. Human faecal pollution occurs throughout the system, particularly on the western banks of the Khayelitsha wetland and is associated with unserviced informal settlements as well as livestock. Grey water from informal settlement areas also drains into the river.

There are several sewage works that discharge treated effluent into the river. The 9SAI military works lies in the Khayelitsha wetlands and discharges less than 1 MI/day. The maturation ponds are inundated in the wet season.

Further information on the Kuils river can be obtained from the Kuils river metropolitan open space system (MOSS), September 1999, compiled by Ninham Shand engineering and environmental consultants and Chittenden Nicks urban and environmental planners. The study describes broad land use designations and management policies which are intended to inform development adjacent to the Kuils river corridor. The river was divided into nine sections and each section was researched in detail according to flooding, water quality, ecological attributes and current land uses. Reference may also be made to the hydrological section of this EMF.

The coastal water quality is however generally acceptable for human recreational purposes. There is coastal water quality data for the following points in and near the study area:

Table 2.3.1: Coastal water quality data

	ALL YEAR, OCT 2003 – SEPT 2004			SUMMER OCT 2003 – MAR 2004	
Location	Samples Examined	<i>E coli</i> /100ml Percentile 80%	<i>E coli</i> /100ml Percentile 95%	Samples Examined	<i>E coli</i> /100ml Percentile 80%
Strandfontein Point	25	28	52	13	7
Strandfontein tidal pool	21	13	67	10	9
Mnandi Beach west	25	36	105	13	44
Mnandi Beach east	24	21	100	13	44
Monwabisi tidal pool	16	33	^	8	63
Monwabisi beach	17	504+	^	8	56

Future focus areas for management have been identified as improvement of water quality, closer cooperation with the Wastewater Department and provision of storm water infrastructure to informal areas.

3 IMPLICATIONS FOR LAND USE IN KHAYELITSHA AND MITCHELL'S PLAIN

The air and water quality problems in Khayelitsha (and to a lesser extent in Mitchell's Plain), indicate that there is a need to:

- Prevent the location of industries that have the potential to contribute to the air pollution problem in the Khayelitsha area, which appears to have a low pollution dispersion potential;
- Investigate means to remove polluting 'home' and informal industries or activities from densely populated areas to alternative areas;
- Maximise efforts to reduce the use of fossil fuels, particularly wood and paraffin;
- Reduce particulates from other sources (such as wind blown sand and dust) through greening projects;
- Educate the population as to the correct methods to use to minimise smoke when use of fossil fuel is unavoidable;
- Educate the population as to the role of the storm water system and the wetlands and the hazards associated with these areas and how they can be

minimized, as well as the opportunities presented by these areas for appropriate open space oriented land use.

Urban renewal projects that can contribute to achieving the above objectives should be welcomed.

SECTION SEVEN
STRATEGIC ISSUE: HISTORICAL AND
CULTURAL RESOURCES IN
KHAYELITSHA AND MITCHELL'S PLAIN

7. SECTION SEVEN

STRATEGIC ISSUE: HISTORICAL AND CULTURAL RESOURCES IN KHAYELITSHA AND MITCHELL'S PLAIN

1. INTRODUCTION

The purposes of this section are:

- i. To identify the heritage and cultural sites
- ii. To determine the possible significance of these sites
- iii. To place the sites within their historical context
- iv. To outline the community's understanding of the historical and cultural resources.

Map 7 shows the location of all the historical and cultural sites identified.

Statement of strategic issue: Historical and cultural sites are an important resource in any community. They serve to record its history and significant events and help to shape the identity of the communities involved. Historical and cultural sites are also an important resource that can be used to assist in the education of children and adults. If the sites are properly identified, cared for and presented, they can become tourist attractions which can generate income for the community. The new Heritage Resources Act (see appendix A) gives a wide definition as to what types of site qualify as heritage sites or sites of historical or cultural importance. Both Khayelitsha and Mitchell's Plain are relatively young townships, with relatively young and mobile communities. Socio-political and economic factors have generally prevented the development of a strong cultural identity with associated sites of importance. However, historical and current events are gradually resulting in the identification of sites which are of importance to members of these communities. These have been identified below. Most of these sites have not been developed or formally recognised in any way. They are also not generally utilized by tourist operators. It is therefore considered strategically important to recognise these sites in the overall planning and development of Khayelitsha and Mitchells Plain. Some of the sites have particularly violent memories associated with them, others are associated with positive historical events. The constraints, sensitivities and opportunities of these sites thus need to be taken into account in the developmental processes taking place in these areas. The input of the affected communities will be essential to confirm the findings of this component of the sensitivity analysis.

2. SUMMARY OF LEGISLATIVE FRAMEWORK

A summary of key legislation is given below. Further details are given in appendix A at the end of this section of the report.

a. National Heritage Resources Act (Act 25 of 1999)

The National Heritage Resources Act (Act 25 of 1999) defines a “heritage resource” as any place or object of cultural significance. Within its definition it identifies heritage resources as (among others to include):

- i. buildings, structures and equipment of cultural significance,
- ii. national or provincial significant landscapes and features,
- iii. graves and burial grounds older than 60 years (and graves of prominent figures in the communities).

The Act also mentions places with strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.

The Act defines “heritage site” as a place declared to be a national heritage site by SAHRA (South African Heritage Resources Agency) or a place declared to be a provincial heritage site by a provincial heritage resources authority.

3. OVERVIEW OF THE CULTURAL AND HISTORICAL RESOURCES OF KHAYELITSHA AND MITCHELL’S PLAIN

3.1 Khayelitsha: historical background

The name Khayelitsha means 'new home'.

Origins: Like many other black townships, Khayelitsha was created during the apartheid era as a dormitory area for the working class. It was established in 1984 during the internecine conflict in the KTC and Crossroads informal settlements. Khayelitsha is the youngest black township to emerge on the Cape Flats. At its earliest development stages, it was an informal settlement.

History: Khayelitsha is situated 35km from Cape Town's CBD and covers an area of about 28 square kilometres. It started with core houses and site and serviced land. The original plan was to move ‘illegal squatters’ from Old Crossroads and New Crossroads to Khayelitsha, but the idea was dropped due to the resistance of the two communities.

Khayelitsha was swept into an instant existence due to the high demand for housing from people flooding into the urban areas, the majority of whom were coming from the Eastern Cape (Transkei & Ciskei). The demand for housing was very high. Khayelitsha has now developed into a township with vast residential areas composed of informal, formal and private developments with informal developments being the largest.

*Cultural resources in Khayelitsha*⁸⁷ : Research has shown that the best history by far is that provided by the people themselves; their stories give a rich, detailed and accurate picture of their experience from past to the present. Elders, young people and community leaders from these communities should be involved in the consultation process representing a good cross section of age, gender and socio-economic backgrounds and knowledge of traditional culture. Research has also shown that people who are dependent on local resources for their livelihood are often able to assess the true costs and benefits of development better than any evaluator coming from the outside.

Identifying cultural resources in Khayelitsha has been a difficult exercise for several reasons, among which are:

- The fact that Khayelitsha is a young township
- Khayelitsha is a product of a political agenda rather than a people's choice, and therefore people never intended to settle in Khayelitsha (there was resistance to go to Khayelitsha) and therefore could not establish themselves fully with all their cultural roots.
- People who came to the Western Cape, especially Cape Town were migrant labourers (they were here temporarily). They came to work or to seek jobs and at intervals go back to their original homes to perform their cultural rituals.
- Khayelitsha is populated mostly by youth because the 'elders' normally go back to their rural homes when they retire from their jobs.
- There is no established 'traditional affairs' institution that could be consulted.
- Khayelitsha is a multi-cultural community and therefore people put more emphasis on those things that unite them than those that separate them (an accommodating culture).
- Land planning, land use, land zoning and land ownership are the challenges the Khayelitsha community is facing. There is no land designated for cultural activities – but open spaces are used on an *ad hoc* basis.
- Development has always been driven by political or economic agendas and never from the cultural perspective, such that people no longer 'think culturally' but in terms of jobs or poverty alleviation.

3.2 Different types of cultural practices

The different cultural practices in Khayelitsha include:

- i. Circumcision practices
- ii. Various practices carried out by traditional healers
- iii. Keeping of livestock

⁸⁷ This information is a product of meetings held with the Khayelitsha Development Forum's (KDF) Environment and Cultural desks (on the 1 February 2005), and Mr Albert Kandekana, (on the 1 March 2005) a traditional healer from Khayelitsha who took us around the circumcision sites, and correspondence with Mr Thandwa Ntshona, Principal Cultural Officer (Heritage Western Cape)].

- iv. Burial sites
- v. Various uses of sand dune areas

3.2.1 *Circumcision initiation sites*

Male circumcision rituals still play a vital role among Xhosa speaking communities in the Western Cape and Khayelitsha is not an exception to this practice. Because of the urban setup people do not own any land to practice this important cultural ritual. The tendency in Khayelitsha is for communities to just use any open space they can find irrespective of land use or ownership. Sometimes people just get permission from the police and go ahead with the ritual. There are minimum requirements for identifying an area where to put the circumcision initiates (taking into consideration the rural/urban divide and the challenges of each). The requirements are:

- reasonable distance from the residential areas
- in a forest or vegetated area so as not to be visible to people (particularly women)
- the area should not be accessible to or used by women at the time of the initiates presence.

Listed below is a list of identified areas which are currently used for initiation as well as a variety of other purposes. It should be noted that the sites used for initiation purposes do change on a regular basis. Please refer to map 7.

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Table 3.2.1.1 Greenpoint circumcision site


<p>Site Area and current activities</p> <p>1. Greenpoint circumcision site (Spine road off-ramp from the N2)</p>	<p><i>Current activities</i></p>	<p>Land use/ownership</p>
	<ul style="list-style-type: none"> - wood gathering - livestock grazing - wetlands - reed gathering 	<p>Council/provincial</p>

Table 3.2.1.2; Town 2 (behind the magistrates court)



- internal open space
- kids playing sports
- close to residence
- Magistrate court

Council land

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Table 3.2.1.3: A's to C's (stretch of land adjacent to Lookout Hill)



- sand mining
- illegal dumping site
- still used for circumcision activities

Private owner

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Table 3.2.1.4: Site B (portion of Greenpoint)



- housing development
- grazing area
- live-stock kraals

Council land

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Table 3.2.1.5; Makhaza: Section 42 (behind dairy & Nabe's shop)



- encroaching residential houses
- livestock grazing
- Western Cape Nature Conservation has earmarked the area for a community park

City of Cape Town

3.2.2 Traditional healers' various practices

Khayelitsha has many different groups of traditional healers who practice different rituals, but the common practices:

- i. gathering medicine (e.g., on the Macassar dunes, in the wetlands etc.)
- ii. cleansing ritual (*ukukhupha iintlānga*): they need a space/land to do this away from the residential area, because of the evil spirits they cast out from their patients. Attempts to find suitable land for this have been unsuccessful as the desired land was in private ownership.
- iii. periodically they need an area to send their initiates (*ukuthwasisa*): they build grass huts for them next to rivers. They are usually taken back to the Transkei and Ciskei for these rituals.

3.2.3 Keeping of Livestock

Keeping cattle, sheep, goats, horses, donkey and even pigs is part of Khayelitsha's cultural practice. These animals are used for both cultural rituals and sustenance. The problem Khayelitsha residents have is lack of suitable land to keep and graze their livestock. As in the case of circumcision rituals, they take their livestock to any available open space they can find, irrespective of ownership or use.

3.2.4 Khayelitsha cemetery⁸⁸

The Khayelitsha cemetery is located adjacent to Steve Biko and Swartklip roads.

It is located on city owned vacant land (forms part of Biodiversity Network and MOSS) and is zoned as Open Space. The Metropolitan cemetery study (draft July 2004) has identified the site as a priority site that needs further development and expansion. Cremation is not yet generally accepted amongst the black African communities and thus there will be a need for significant expansion of burial sites.

3.3 Historical and Cultural sites

3.3.1 Sand dunes

The Macassar sand dunes have played an important botanical and social role in the Cape Flats area. There is a Muslim Kramat located within the dune area (east of the study area). The kramat is of religious significance to Muslims in the Western Cape region. People from the nearby communities gather wood, harvest medicinal plants

⁸⁸ Metropolitan Cemetery study: Phase II Priority Assessment (Draft). Report No: 1392/R1. July 2004

and hunt on the Macassar dunes.

3.3.2 Lookout Hill

When entering Khayelitsha from Mitchell's Plain it is possible to visit Lookout Hill, which gives a good view of the whole area. The hill, on Bonga Road next to Ilitha Park is being developed as a permanent cultural tourist attraction, with arts and crafts stalls.

3.4 Sites that are linked to the liberation struggle in Khayelitsha⁸⁹

Khayelitsha sites associated with the struggle are listed in the table below.

Table 3.4.1: Khaya Bazaar



Event: Rallies led by ANC/COSATU/UWCO/COSAS
Present uses/ activities: <ul style="list-style-type: none">- Bazaar still there and is surrounded by a residential area- Open space at the back of the Bazaar – used for informal sports activities- There's also public open space that is not used

⁸⁹ Khayelitsha Beautification and Poverty Alleviation Research Project Report. (December 2003) Institute for Justice and Reconciliation. P.20-21.

Table 3.4.2: Parks and fields, A–section

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Event: Civic meetings

Present uses:

- the area has been developed into a community peace park (Manyanani Peace Park)
- it is in the midst of a residential area and adjacent to a public open space

Table 3.4.3: Injongo Primary School

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Event: Khayelitsha ANC executive meeting place

Present uses:

- it is still a primary school
- it is in the centre of a residential area next to a public open space and a wetland

Table 3.4.4: Site B, M-section

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Event: Venue for ANC underground strategic committee meetings

Present activities:

- it is a residential area – an informal settlement but is being upgraded into a low cost housing area.

5. A-section at Murray: SHAWCO offices and site of concentrated

Present activities:

- SHAWCO office is still there and still in full operation and involved in different community projects

Table 3.4.5: J-Section

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Event: Concentration of gangsterism

Present activities/uses:

- the street still exists and is in the middle of residential area on one side and the Bulumko High School on the other.
- There are claims of gangsterism activities still taking place in the area though not as high as it used to be in the past.
- This corridor is in a strategic position in that all the streets in that area are linked to it at the bottom.

3.5 Mitchell's Plain: ⁹⁰Historical Background

Mitchell's Plain was established as a dormitory town in the 1970s. The new residents did not spend much time in the area, often travelling between their 'new' place and their 'old' places from where they were moved. Current residents in Mitchell's Plain were originally from other areas on the Cape Flats (Athlone, Bonteheuwel, Kensington, and Steenberg). At first the city was not successful in convincing coloured people to move to Mitchell's Plain. Transport costs were high. There were no economic opportunities within Mitchell's Plain, so people were forced to seek employment elsewhere and commute to work on a daily basis. The average salary at that time was R100 pm. Councillors began to offer incentives to get young families to move into Mitchell's Plain. As a result Mitchell's Plain is still a very young community.

Culturally there has been very little change. The most significant is the emergence of "kombuis engels", now spoken by people who formerly spoke Afrikaans. It is an Afrikaans slang that has developed over the years and has come to be identified with Mitchell's Plain. It is a mix of English and Afrikaans. On the whole, people continued with their culture even in the new area. But, unfortunately this history was never recorded and there is no place to keep records of that history and the history of the people of Mitchell's Plain because there is no museum or archives.

Mitchell's Plain's heritage and cultural resources, unlike Khayelitsha's, do not have spatial implications or demands, but are more intangible, historical and based on already existing facilities that might need to be developed.

The people of Mitchell's Plain want a cultural centre of their own where the Malay choirs, dance groups and all other cultural activities can take place.

3.6 Historical and cultural resources

3.6.1 Meeting places and places of recreation

A variety of meeting places are considered to be culturally important in Mitchell's Plain. These include shebeens, sports facilities and gardens. A brief description of these is given below.

a) *Shebeens*: People who were moved to Mitchell's Plain were forced to find ways and means to survive. Shebeens were among the means of survival because they put food on the table for poor coastal towns such as Mitchell's Plain. Many people did not support the shebeens because they brought crime and filth to the area. But shebeens were the first form of business to emerge in Mitchell's Plain. Shebeens are not culturally acceptable but they brought some sense of psychological relief for those

⁹⁰ Meeting held on 20th January 2005 with Mitchell's Plain Development Forum (Cultural, heritage and environment sector heads)

who used them and financial relief for those who operated them. They were regarded as places to relax and share life experiences, even though their presence facilitated alcohol abuse and associated crime.

b) *Sports facilities*: Mitchell's Plain has a very rich culture of sport but sports facilities were not included in the planning of the township. Those sports facilities that are present are considered to be poorly planned. There is a desire for proper facilities for Soccer, Rugby, Baseball, and Basket ball.

c) *Gardens*: There are some gardens in Mitchell's Plain but they are generally in need of attention. There is one in Westridge (close to Morgenster). There is an old dilapidated amphitheatre on site which used to be a family gathering place. Presently people use it for taking wedding photographs.

3.6.2 Cemeteries

Because of the high water table, land use for this purpose is restricted. Presently Mitchell's Plain residents are using Maitland, Muizenburg, Ottery, Klipfontein, and Eden memorial (donated by farmer) for burials. Most people in Mitchell's Plain are however, now changing to cremations because they are less expensive.

3.6.3 Dunes and beaches

Rocklands is a natural dune area and has a high density of alien vegetation. This is the last existing dune, and is part of the Cape Tourism route. This route starts at Baden Powell drive and extends to Mnandi beach. This dune is referred to as romantic dune because on valentines day lovers go there just to sit, for engagement, renew their marriage vows, whale watch etc.

Mnandi beach is a Blue Flag beach⁹¹. The locals call it 'unemployment beach', because when people started to work they would go there to celebrate.

3.6.4 Freedom square

This square brings back many memories such as defiance campaigns, political rallies, public speeches by people such as Trevor Manuel, Allan Boesak, Tony Leon and many others.

3.6.5 Rocklands Civic Centre

UDF was founded in this Centre 22 years ago. It is a place of significance to the people of Mitchell's Plain.

3.6.6 Portlands sports grounds

Political activists used to gather on this ground in the 1980s to plan their activities and even used the grounds to hide arms caches. It is also a place where many comrades were caught by police and were detained.

⁹¹ CoastCare are facilitating the development of Blue Flag beaches. A beach is designated a Blue Flag Beach when it meets certain criteria in terms of water quality and quality of facilities.

3.6.7 Station strangler

The serial killer (known as the Station Strangler) used Rocklands and Wolfgat sites to kill and to dump the bodies of the victims. Any development in these areas would have to be sensitive to this history, and therefore bring about healing memories where there were once devastating experiences.

3.6.8 Fishing

Traditionally families would go out to the coastline and catch their own fish (snoek). But fishing legislation has changed this family practice and does not allow for this. Individuals have to get permits and those who do not get the permits have to survive by buying fish. This is slowly killing the tradition of going fishing. There is also a need for jetties for people of Mitchell's Plain, as people who have ski boats have to launch them elsewhere.

3.6.9 Palaeo-ecological sites of interest

During April 1996 students of the Department of Geology, University of Cape Town, discovered a horizon containing fossil bone in the sand and limestone cliffs near Swartklip on the False Bay coast. Subsequent investigations revealed the existence of fossil bearing deposits at three localities. The fossils collected from the site were generally well preserved and included bones from a wide variety of animals. It has been surmised that the bones were deposited on the floor of a small cave or rock shelter used as a lair. Perhaps the most significant evidence in support of the lair theory is provided by the official name, Wolfgat, of the area in which the sites are located. This Afrikaans word, which literally translated is 'wolf-hole' but in free translation means 'hyena-lair', is an example of localities after animals, a common practice amongst the early European settlers in South Africa. Remains of the brown hyena occur at the site and since it is also well known as a scavenger on sea shores, it is the animal considered most likely to have given rise to the name Wolfgat.⁹² Animal bones recovered at the site include African hunting dog, lion, hippopotamus, rhinoceros, reedbuck, blue antelope, black – backed Jackal, Egyptian mongoose, honey badger, Cape dune mole, ostrich and many others. The fauna are surmised to be pre-Holocene in age⁹³. The importance of the Swartklip sites lies chiefly in the fact that they have provide a great deal of information on the nature and character of the local late Pleistocene mammalian fauna, exclusive of the very small species.

4 ALLOCATION OF SENSITIVITY RATINGS

It is not possible to make any distinction between the different cultural sites in terms of their importance or sensitivity. All sites should be regarded as having high sensitivity. The very different nature and context of each site has to be taken into account in the development process. In many cases, it is unlikely that the legal

⁹² Hendey, Q.B. and H. New Quaternary Fossil Sites near Swartklip, Cape Province. In *Annals of the South African Museum*. Vol 52, 1968 – 1969.

⁹³ Henday, Q.B. The Late Cenozoic Carnivora of the South Western Cape Province. In *Annals of the South African Museum*, Vol 63, January 1974.

requirement to conduct environmental or heritage assessments will be triggered. As a minimum however, there should be public and community consultation about any developments that could affect cultural/historical sites. Means to maximise the development of a cultural identity and any associated socio-economic benefits need to be identified, evaluated and incorporated into development proposals.

5 CONCLUSION

To reiterate what has been stated already, the best history by far is that provided by the people themselves; their stories give a rich, detailed and accurate picture of their experience from past to the present. It will be necessary for people in both communities, especially Khayelitsha (because of its traditional 'central authority' and ancestor/spirit based approach to culture) to come up with criteria for identifying cultural resources and their suitable locations. The difficulty with this could be the fact that such fora or 'authorities' do not exist and the urban setting does not cater for such 'authorities'. Input of the communities concerned will be important to confirm this preliminary identification of sites of historical and cultural significance. Developments that are proposed in the area need to take the cultural context into account as well as any opportunities or constraints associated with the various sites identified in this report.

APPENDIX: A

1. Legislative framework

1.1. National Heritage Resources Act (Act 25 of 1999)

The National Heritage Resources Act (Act 25 of 1999) defines a “heritage resource as any place or object of cultural significance”. Within its definition it identifies heritage resources as (among others to include):

- iv. buildings, structures and equipment of cultural significance,
- v. national or provincial significant landscapes and features,
- vi. graves and burial grounds older than 60 years (and graves of prominent figures in the communities).

The Act also mentions places with strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.

The Act defines “heritage site” as a place declared to be a national heritage site by SAHRA (South African Heritage Resources Agency) or a place declared to be a provincial heritage site by a provincial heritage resources authority.

1.1.1. Section 7* **Heritage assessment criteria and grading*

(1) “SAHRA, in consultation with the Minister and the MEC of every province, must by regulation establish a system of grading of places and objects which form part of the national estate, and which distinguishes between at least the categories-

- i. Grade I: Heritage resources with qualities so exceptional that they are of special national significance;
- ii. Grade II: Heritage resources which, although forming part of the national estate, can be considered to have special qualities which make them significant within the context of a province or a region; and
- iii. Grade III: Other heritage resources worthy of conservation,

and which prescribes heritage resources assessment criteria, consistent with the criteria set out in section 3 (3), which must be used by a heritage resources authority or a local authority to assess the intrinsic, comparative and contextual significance of a heritage resource and the relative benefits and costs of its protection, so that the appropriate level of grading of the resource and the consequent responsibility for its management may be allocated in terms of section 8.

(2) A heritage resources authority may prescribe detailed heritage assessment criteria, consistent with the criteria set out in section 3 (3), for the assessment of Grade II and Grade III heritage resources in a province”.

1.1.2. Section 27 National heritage sites and provincial heritage sites

(1) “SAHRA must identify those places with qualities so exceptional that they are of special national significance in terms of the heritage assessment criteria set out in section 3 (2) and prescribed under section 6 (1) and (2), and must investigate the desirability of their declaration as national heritage sites.

(2) A provincial heritage resources authority must identify those places which have special qualities which make them significant in the context of the province or a region in terms of the heritage assessment criteria set out in section 3 (2) and prescribed under section 6 (1) and (2) and must investigate the desirability of their declaration as provincial heritage sites.

(3) Any person may submit a nomination to SAHRA for a place to be declared a national heritage site or to the provincial heritage resources authority for a place to be declared a provincial heritage site”.

1.1.3. Section 31 Heritage areas

(1) “A planning authority must at the time of revision of a town or regional planning scheme, or the compilation or revision of a spatial plan, or at the initiative of the provincial heritage resources authority where in the opinion of the provincial heritage resources authority the need exists, investigate the need for the designation of heritage areas to protect any place of environmental or cultural interest

(5) A local authority may, by notice in the Provincial Gazette, designate any area or land to be a heritage area on the grounds of its environmental or cultural interest or the presence of heritage resources, provided that prior to such designation it shall consult-

- (a) the provincial heritage resources authority; and
- (b) owners of property in the area and any affected community, regarding inter alia the provisions to be established under subsection (7) for the protection of the area”.

1.1.4. Section 36 Burial grounds and graves

(1) “Where it is not the responsibility of any other authority, SAHRA must conserve and generally care for burial grounds and graves protected in terms of this section, and it may make such arrangements for their conservation as it sees fit.

(2) SAHRA must identify and record the graves of victims of conflict and any other graves which it deems to be of cultural significance and may erect memorials associated with the grave referred to in subsection (1), and must maintain such memorials.

(3) No person may, without a permit issued by SAHRA or a provincial heritage resources authority-

- (a) destroy, damage, alter, exhume or remove from its original position or otherwise disturb the grave of a victim of conflict, or any

burial ground or part thereof which contains such graves;

(b) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority ...”

2. The Constitution (Act 108 of 1996)

The Constitution (Act 108 of 1996) leaves the management of these significant resources broadly to the provincial/local/communities/ or any legitimate governance systems as part of their planning process.

2.1. Other significance factors to consider

The significance of a place could be influenced by spiritual, religious, cultural, political, social, historical, aesthetic and scientific contextual factors.

The extent of the heritage significance could be: National, Provincial, Local, Community based, group and or, Family level.

The significance of a cultural resource could be on the level of a community, interest groups, a clan or a family. On the cultural level it has been important for the study to understand the history of both communities, Mitchell’s Plain and Khayelitsha. The cultural context needs to be understood within the broad establishment of the two communities.

2.2. Heritage and Development

2.2.1. Section 38 Heritage resources management

1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50m in length;
- (c) any development or other activity which will change the character of a site-
 - (i) exceeding 5 000m² in extent; or
 - (ii) involving three or more existing erven or

- subdivisions thereof; or
 - (iii) involving three or more erven or divisions thereof
 - which have been consolidated within the past five years; or
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;
 - (d) the re-zoning of a site exceeding 10 000m² in extent; or
 - (c) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

2.3 Legislation specific to Cemeteries⁹⁴

In most instances, the reservation of land for cemetery purposes will require a rezoning of the land. The exception will be where an adjacent land portion will acquire a deemed zoning through consolidation with an existing cemetery. This will only be applicable to small land portions. The rezoning requirement will usually trigger the requirement for an Environmental Assessment. The Department of Environmental Affairs and Development Planning have indicated that the pending National Environmental Management Act EIA regulations will require that cemeteries and crematoria (new and expansion) be subject to the submission of an Environmental Checklist (or Initial Environmental Assessment) as a point of departure, with a Scoping report or full EIA if required. Crematoria also require an Air Pollution Permit. The Department of Water Affairs and Forestry (DWAF) also have to be consulted with regard to the requirements of the National Water Act (Act 36 of 1998) and whether authorisation from DWAF is required.

⁹⁴ Metropolitan Cemetery Study, Phase ii: Priority Assessment (Setplan – July 2004) Draft.

PART THREE

ANNEXURE 1
EMF METHODOLOGY
&
STAKEHOLDER CONSULTATION
&
CAPACITY BUILDING PROCESS

ANNEXURE 1

EMF METHODOLOGY AND STAKEHOLDER CONSULTATION AND CAPACITY BUILDING PROCESS

1. Process of compiling the EMF

The EMF is made up of two main parts, namely:

- A situation assessment which provides descriptive information about the key environmental factors that need to be taken into account in planning and developing the remaining open space in Khayelitsha and Mitchell's Plain
- The management framework, which uses information from the situation assessment to identify two control zones which should influence development types and environmental evaluation processes.

Compilation of the EMF involved four main activities:

1. The identification of the main strategic issues and environmental aspects that have the most influence in determining how and where development can proceed in Khayelitsha and Mitchell's Plain.
2. Collection and collation of information related to the identified strategic issues and environmental aspects.
3. Evaluation of the information to determine its relevance to compilation of the EMF.
4. Presentation of the information (using a Geographic Information System) into an EMF.

Strategic issues for Khayelitsha and Mitchell's Plain are based on (and consistent with) the communities' visions for their environment. The role of the situation assessment is to provide a status quo of strategic issues that have been identified in Khayelitsha and Mitchell's Plain. In this report strategic issues are understood as the critical environmental challenges in Khayelitsha and Mitchell's Plain that must be addressed in order for the communities of Khayelitsha and Mitchell's Plain to achieve their vision. The situation assessment presents a status quo of the strategic issues and highlights opportunities and challenges around these issues.

The strategic issue and environmental aspect identification process required familiarization with the Khayelitsha and Mitchell's Plain environment, as well as consultation with key parties familiar with these two areas. These parties included the planners for the area, the team involved in compiling the Spatial Development Framework for Khayelitsha and Mitchell's Plain, and members of the urban renewal project team. Collection and collation of the information about the environmental aspects involved a literature search, as well as sourcing of information from data sources such as the City of Cape Town's environmental information network.

A second and parallel component of the EMF compilation process was a stakeholder consultation and awareness raising project described below.

2. Stakeholder consultation and awareness raising during compilation of the EMF

For the EMF to be effective, all stakeholders, especially government authorities, local representatives from civil society and political representatives such as Ward Councillors, need to be empowered regarding the need for, purpose and application of the EMF.

The Environmental Evaluation Unit (EEU) was tasked by the City of Cape Town to undertake awareness raising activities targeting specific stakeholder groups. These stakeholder groups were identified by the City as follows:

- Community leaders and city councilors from the Mitchell's Plain and Khayelitsha Development Forums, Ward and Sub-Council Councilors;
- Youth (those engaged in the Eco-Schools Programme); and
- City and Provincial officials.

The key aims of the awareness raising set of activities were:

- To familiarize and educate stakeholders on the role and objectives of the EMF and how it should be utilized;
- To provide opportunities for stakeholders to participate in the design of the EMF;
- To raise awareness amongst stakeholders of plans and policies that are complimentary to the EMF;
- To raise awareness regarding the opportunities for stakeholders to monitor their own environment using the key indicators identified in the EMF;
- To enhance the capacity for stakeholders to engage with environmental issues at a project specific level;
- To bring stakeholders from the two urban renewal nodes together; and
- To forge linkages with the Spatial Development Framework capacity building program, so as to ensure an integrated approach to these processes.

A set of three awareness raising Saturday morning workshops were planned for the Mitchell's Plain Development Forum (MPDF) and the Khayelitsha Development Forum (KDF). Invitations to these workshops were also extended to the local ward councillors and sub-council members. Logistical reasons (predominantly number of participants and suitability of date) resulted in the development fora engaging in the process independently from each other. Two successful workshops have been held with the MPDF, the third to be held upon completion of the draft EMF. The workshops with the KDF were cancelled at short notice, such that all three are still pending.

The workshops introduced elementary environmental management principles and illustrated their application in spatial development planning and integrated

environmental management. Subjects introduced included Integrated Development Planning, Spatial Development Frameworks and Environmental Management Frameworks, as well as Environmental Impact Assessment processes and the use of Environmental Management Plans. The rights of civil society with respect to environmental law in South Africa, and the opportunities for public participation in environmental planning and management were highlighted throughout the workshops. A representative from the team developing the spatial development framework for Khayelitsha and Mitchell's Plain presented and engaged with the MPDF during discussion concerning Urban Renewal for the area.

Teachers from 5 schools in Mitchell's Plain (Westridge High, Oval North, Spine Road High, Strandfontein High, and Aloe High) and 5 schools in Khayelitsha (Mathew Goniwe Memorial High, Chuma High, Intlanganiso High, Esangweni High and Masiyile High)

were invited to participate in 4 mid-week workshops held after school hours. Two of the workshops were based in Mitchell's Plain, and two were based in Khayelitsha. Two site visits were organised, such that participants were able to familiarise themselves with opportunities for utilising their surrounding natural environment as outdoor classrooms.

Like the workshops with the development fora, these teacher workshops were participatory in nature, and built upon the knowledge and experience of the participants. In addition, the programme provided practical teaching tools that could be utilised in the classroom environment (e.g. demonstrating sustainability principles using polystyrene cups and providing laminated aerial photographs of the Mitchell's Plain and Khayelitsha area to each school).

All the participants who engaged in either the Saturday morning or mid-week awareness raising interventions indicated a willingness to continue participating in similar enrichment sessions on an ongoing basis.

A member of the Urban Renewal Project Team is in the process of co-ordinating a seminar/workshop that aims to raise awareness and inform city officials regarding the progress and outputs associated with the Urban Renewal Programme for Khayelitsha and Mitchell's Plain. It is anticipated that a summary of the Environmental management Framework and its findings will be provided in the form of a Background Information Document (currently in draft format).

Liaison with members of the provincial Department of Environmental Affairs and Development Planning has been ongoing. Representatives from this department have provided input and guidance with respect to institutional mechanisms for adopting and implementing the EMF.

3. Assumptions and limitations relevant to the use of the Situation Assessment

The following information needs to be taken into consideration when utilizing information contained in the situation assessment:

- a) The information utilized in the situation assessment is largely secondary data that has been gathered from a variety of sources (referenced). Some of the information is very recent, whereas other information dates from several years back. The information has not been checked or 'ground truthed' and therefore where information is critical to a decision, it is recommended that the necessary steps be taken to ground truth or check the information from the relevant sources.
- b) The search for information relevant to the Situation Assessment has been comprehensive, but significant gaps in information have been found. These information gaps have been noted wherever possible. It is possible that other less formal or undocumented sources of information may exist. It is recommended that all possible sources of information be utilized (including knowledge that exists within the affected communities) when assessing development or other applications or proposals.
- c) The maps compiled for this EMF have also been derived from a variety of other information sources, predominantly the City of Cape Town's Environmental Information System. In some maps, boundaries have been shown which are related to the sensitivity of an environmental component (for example the sensitivity zones for the aquifer). These boundaries should only be regarded as a guideline as they are not precise at a small scale.

ANNEXURE 2
SUSTAINABILITY PRINCIPLES AND
PRACTICES

ANNEXURE 2

INCORPORATING SUSTAINABILITY PRINCIPLES AND PRACTICES INTO THE URBAN RENEWAL PROGRAMME

1. INTRODUCTION

This annexure introduces the concept of sustainable development (section 2) and the global call for sustainable development (section 3). This is followed by a summary of the South African response to this call, with an emphasis on the Western Cape provincial response (section 3.1). The discussion in section 3 is then considered with respect to incorporating sustainability principles and approaches into urban renewal in Khayelitsha and Mitchell's Plain (section 3.2).

2. THE CONCEPT OF SUSTAINABLE DEVELOPMENT

The concept of sustainable development first became the focus of international policy-making with the publication in 1987 of *Our Common Future*, a report that presents the outcome of the World Commission on Environment and Development and that served as an important foundation for the 1992 UN Earth Summit. Sustainable development is defined in this report as development that “*meets the needs of the present without compromising the ability of future generations to meet their own needs*”.

Sustainable development is about behaving in a manner in which current efforts to raise the quality of life of a society's citizens (i.e. “development”) can be continued (or “sustained”) into the future. It is about adopting a development path that improves the quality of life of current generations, while leaving future generations with at least the same capacity and options for development that we have at present.

For sustainability to be achieved, decision-makers need to consider the longer-term implications of their decisions and recognise the important interdependencies between the “triple bottom line” of *economic* growth, *social* equity and *environmental* integrity.

A useful way of conceptualising sustainable development is in terms of three embedded spheres comprising economic systems that are essentially products of, and dependent on social systems, which in turn are products of, and dependent on natural systems (see Figure 1). These spheres may be seen as three globes, with the outer ones surrounding, enclosing and supporting the inner ones. This model conveys the notion that our natural resources, and the goods and services provided by these resources and processes, are the key enabling factor for socio-economic development. These

Box 1: Summary of Key Sustainability Principles *

- Integration of social, environmental, economic and institutional issues.
- Concern for the future – thinking about how the action or decision you take now will affect future generations.
- Social justice and equity, including working to eradicate poverty.
- Avoiding disturbance to ecosystems and loss of biodiversity, and recognising and working within ecological limits.
- Public participation and forming partnerships between public, private and community groupings.
- Adopting a multi-sectoral approach.
- Accountability, and transparency.
- Monitoring and evaluation to assess how we are doing.
- Linking local issues to global impacts.
- Local economic development and job creation.

**Note: Section 2 of the National Environmental Management Act (107 of 1998) also sets out a useful set of principles for sustainable development*

activities and processes rest on, and are influenced by, the prevailing governance system – the fourth dimension.

The **economic dimension** refers to the production of manufactured goods, and their flow through the formal and informal sector. Sustainable economic systems entail growth that is viable, fair and efficient, considering wealth distributions and inequality. This growth must occur at a rate which does not exceed the capacity of natural and social systems.

The **social dimension** refers to human capacities, skills and resources which are necessary for productive work and the creation of a reasonable quality of life. It stresses community participation and social justice, with equitable access to resources, paying particular attention to the most vulnerable members of society.

The **natural environment dimension** refers to the natural resources (matter and energy) and ecosystem processes that maintain life and produce and deliver goods and services. They include renewable resources (such as freshwater, fisheries and wood), non-renewable resources (such as mineral deposits and fossil fuel), sinks (that absorb, neutralise or recycle wastes), and ecological processes such as photosynthesis, climate regulation and disease regulation.

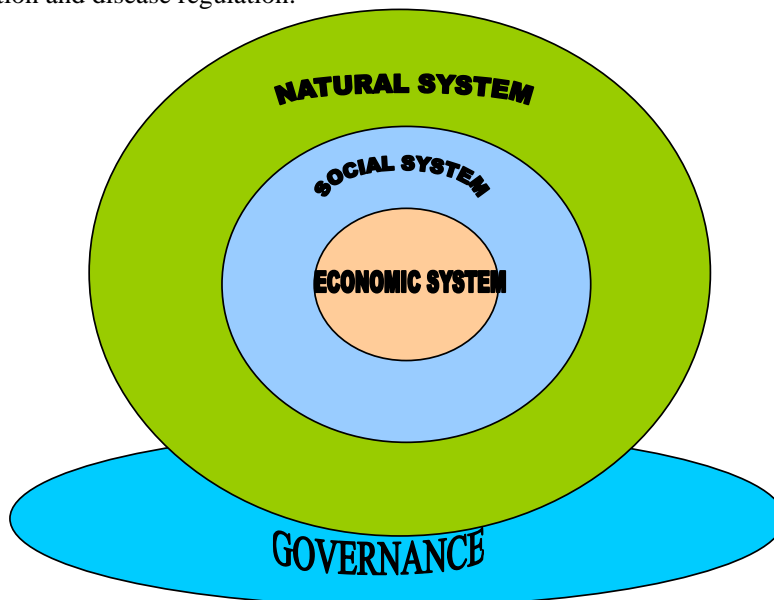


Figure 1: Relationship between the economic, social, natural and governance dimensions of sustainable development.

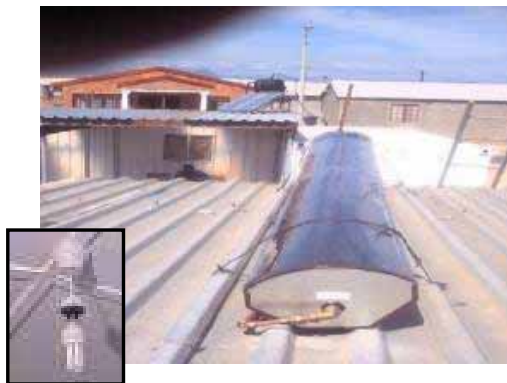
The **governance dimension** comprises the institutions, processes, systems and mechanisms through which national, provincial or local affairs are managed, and through which citizens articulate their interests, exercise their responsibilities, cooperate and/or indicate their differences.

The crisis of sustainability is seen to arise from the fact that our current production and consumption patterns, based purely on economic grounds, are depleting natural resources and impacting on human and social systems, largely because we fail to assign sufficient value to any other assets during our decision-making processes. See Case Study 1 that illustrates the benefits of considering all components of sustainable development.

Sustainable development is not a new idea. Many cultures over the course of human history have recognised the need for harmony between the environment, society and economy. A simplified summary of “sustainability principles” is provided in Box 1.

Case Study 1: A commitment to more sustainable housing

Installing ceilings, solar water heating and energy efficient light bulbs increases the cost of building a house. A local project has undertaken a pilot study to assess the impact of installing these additional features in low-income houses in Khayelitsha. The economic costs of adding these features are being compared with the savings associated with improved comfort and health (less sickness), as well as improved safety (less chance of paraffin related accidents and fires) of the homeowners. Findings also indicate that homeowners involved in this project use 40% less energy than their neighbours in conventional houses, and thereby experiencing real cash savings.



Solar water heating unit and compact fluorescent light bulb

3. THE CALL FOR SUSTAINABLE DEVELOPMENT

In September 2000, the General Assembly of the United Nations recognised the Millennium Development Goals (relating to poverty eradication, gender equality, education, health and environmental sustainability), as the road map for sustainable development. Global commitment to these goals has been reinforced through several major international meetings and agreements relevant to sustainable development. In 2002, nations of the world gathered in Johannesburg to review progress on commitments made at the Rio Earth Summit in 1992, and to focus on strategies to achieve the Millennium Development Goals. The commitment to develop strategies for sustainable development was captured in the Johannesburg Plan of Implementation (JPOI) as follows: “States should take immediate steps to make progress in the formulation and elaboration of strategies for sustainable development and begin their implementation by 2005”.

3.1 National and Western Cape provincial response to the JPOI

National, provincial and local development initiatives should, in response to the JPOI,

incorporate sustainability principles in all projects, plans, programs and policies. Furthermore, these should be nested within each other, such that they support each other in contributing cumulative and collective efforts towards sustainable development.

Several significant national and provincial steps have been taken in order to place South Africa on the path towards sustainable development. National initiatives include, for example, the Reconstruction and Development Programme (RDP), the Integrated Sustainable Rural Development Strategy (ISRDS), the Urban Renewal Programme (URP). Based on the JPOI, sustainability considerations must be integrated into strategies and programs relating to urban renewal, which focuses on investment in social and economic infrastructure, human resource development, enterprise development and poverty alleviation.

Nationally, the delivery of housing is at the forefront of the Government's development agenda. The majority of South Africans are living in conditions of extreme poverty with many in informal settlements. Within this context the mandate of the national Department of Housing is "to ensure the provision of adequate and sustainable human settlements in accordance with international commitments (Habitat Agenda, Local Agenda 21, Kyoto Protocol, etc.)". At national government level, there has recently been a shift in policy focus from a number of units only to a quality of products and environments type approach. In 2001, a Cabinet resolution was passed to prioritise, mainstream and scale up energy-efficiency measures in housing and human settlements in South Africa. Appropriate housing design, the incorporation of sustainable building materials and insulation in housing can materially contribute to more energy-efficient housing outcomes – outcomes which are now well recognized as major contributors to enable household savings, enhance quality of life and comfort, and materially contribute to health improvements. The Energy Efficiency Strategy of RSA (2004) aims to introduce mandatory standards for energy efficiency by 2015. These standards will be incorporated into the Building Code. A national standard that defines specific requirements, SANS 0283 Energy efficient buildings, is currently being drafted.

Various initiatives implemented in order to address sustainable development in the Western Cape include, amongst the most important, the Ikapa Elihlumayo Strategy and the Provincial Growth and Development Framework (PGDF) Agreement. Both Ikapa Elihlumayo and the PGDF recognise that, in order to meet their objectives, there must be good governance and sustainable use of resources.

Bioregional planning has also been adopted as a planning and management approach to promote sustainable development in the Western Cape. Bioregional planning is a tool to match the planning, design and development of human settlement and land-use patterns (i.e. 'people' impacts) with the biophysical (i.e. 'natural') environment. Bioregional planning assists in the preparation of integrated development plans (IDPs), spatial development frameworks (SDFs) and spatial development plans

Box 2: Bioregional Planning Manual

The Department of Environmental Affairs and Development Planning, Western Cape have produced a Bioregional Planning Manual (October 2003).

This manual promotes the use of bioregional planning in order to prepare Integrated Development Plans, Spatial Development Frameworks and Spatial Development Plans. This manual is available at:
<http://www.capegateway.gov.za/>

(SDPs) (See Box 2 alongside). Both the Coastal Management Policy and Coastal Management Programme for the Western Cape also support the bioregional planning approach and sustainability principles.

Based on the National Spatial Development Perspective (NSDP) published by the presidency in November 2002, and running in parallel with the promotion of bioregional planning, is the process of formulating the Provincial Spatial Development Framework. This framework also calls for sustainable development and was released in May 2005 for public comment.

Finally, the Western Cape Provincial Department of Environmental Affairs and Development Planning is in the process of developing a coherent, overarching Sustainable Development Implementation Plan to address the economic, social and ecological dimensions of sustainable development. The Western Cape's first State of Environment Report (2004) generated a list of 16 Priority Environmental Issues. These provided an input into the Quality of Life (QOL) Index that has been used to measure the 'state of development' in the province. It is anticipated that this QOL Index will be incorporated into the Sustainable Development Implementation Plan. This will make it possible to measure progress in achieving sustainable development on an annual basis.

With respect to the energy sector, the Department of Environmental Affairs and Development Planning has embarked on a process of developing an Integrated Energy Strategy and Programme for the Western Cape. This process is seeking to develop a strategy and programme that will ensure that economic and social development, poverty alleviation, infrastructure development, environmental issues, energy conservation and climate change, energy security and energy investment are effectively addressed from a sustainable development perspective. In August 2003 officials of Provincial Administration of Western Cape (PAWC) and the National Home Builders Registration Council⁹⁵ (NHBRC) came

⁹⁵ The main aim of the NHBRC is to protect consumers and to regulate how The NHBRC have a *Homebuilders Manual*, which sets out standards with register and agree to provide a five- year warranty of their work.

Box 3: Some examples of energy efficiency in buildings

Passive Design

This means designing with nature (solar radiation and wind) to ensure thermal comfort with minimum additional energy inputs. Design strategies include:

- Optimum orientation of the building in terms of solar radiation (to allow heat gain)
- Natural lighting and energy efficient fittings (compact fluorescent light bulbs)
- Natural ventilation and cooling – optimum use of prevailing winds and natural air movement through buildings
- Shading by roof overhangs or vegetation
- Solar water heating
- Window placement and size
- Thermal mass
 - A building's thermal mass is made up of floors, walls, roof, partitions etc.
 - High thermal mass, usually masonry or concrete, slows down the buildings response to changes in external conditions and limits the internal temperature swings.

Embodied energy

The embodied energy of materials includes the non-renewable energy consumed in the acquisition of raw materials, (e.g. mining); processing, manufacturing, transportation to site and construction. For example, Aluminium has a high embodied energy whilst locally produced timber has a low embodied energy.

Insulation

The function of insulation is to prevent heat flow in and out of a building. The interior of a building will be cooler in summer and warmer in winter, providing comfort to the occupants and reducing energy consumption used for heating and cooling. Typically, most heat is lost or gained via the roof; therefore putting an insulating ceiling in is the most effective way of improving energy efficiency.

to an agreement that houses in the Southern Cape Coastal Condensation Problem Area (SCCP) [Cape Town] area must have specific interventions to improve thermal efficiency such as external plaster, a Gypsumboard ceiling and an insulation blanket above the ceiling. The top-up subsidy for these thermal efficiency measures has been increased and now stands at R3900. This is at present the only Province of South Africa that has an additional subsidy for thermal efficiency interventions. The City of Cape Town has very recently begun a process of developing Green Building Best Practice Guidelines, which may result in a Green Building By-Law.

At a more practical level, all provincial sector departments are required, in terms of the National Environmental Management Act, to develop Sectoral Provincial Environmental Implementation Plans (EIPs). The EIPs should reflect how the activities of provincial government affect the environment, and provide useful information to planners, IDP managers and others regarding the impacts that different sectors have on environmental resources and services. EIPs also indicate measures that departments will take to address environmental sustainability considerations.

Finally, the governance dimension of sustainable development is receiving attention in the Western Cape, as the provincial Department of Environmental Affairs and Development Planning has embarked on a law reform process to develop integrated legislation that covers land use management and planning, environment and heritage resources. This process aims to streamline planning and development approval processes in a way that ensures responsible and sustainable development. The law reform process was initiated in September 2004 and is due to be completed by mid 2006.

3.2 Incorporating sustainability principles and approaches into Urban Renewal in Khayelitsha and Mitchell's Plain

Numerous reports describing visions and approaches for promoting sustainable development at the local metropolitan and municipal levels have been compiled (see Box 4). The Khayelitsha and Mitchell's Plain Urban Renewal Spatial Development Framework (URSDF) is a long term planning process that has recently been developed in order to respond to issues undermining sustainable development in the Khayelitsha and Mitchell's Plain area. The URSDF is based on the City of Cape Town's IDP and the Urban Renewal Strategy and Business Plan.

Three of the key foci of development in Khayelitsha and Mitchell's Plain are: (i) enabling economic development; (ii) improving access to social services and economic opportunities, and (iii) improving levels of safety. Bearing in mind the JPOI, it is essential that these social and economic dimensions do not lose sight of the natural environment dimension which provides the resources and ecosystems

Box 4: Examples of planning studies for development in the City of Cape Town, with an emphasis on Khayelitsha and Mitchell's Plain.

1999:

- Metropolitan Spatial Development Framework
- Khayelitsha wetlands management study
- Monwabisi Environmental Management Framework
- Kuils River Metropolitan Open Space System
- Kuils River between the N1 and Bottelary Road – Access for maintenance and recreation (plus related river upgrade projects) action plan.

2000:

- City of Tygerberg Spatial Development Framework

2001

- Integrated Metropolitan Environmental Policy
- Urban Renewal Vision
- Wolfgat Nature Reserve – Draft Environmental Management

necessary to maintain life and to provide environmental goods and services, such as provided through the maintenance of wetlands (see Case Study 2).

CASE STUDY 2: *Harnessing the value of the natural environment*

The Liesbeek river flows, for the most part, in a concrete canal. Few plants and animals can live in the canal, which is frequently choked with litter. In addition, the canal is a hazard for children and animals, particularly when the canal is full of water and flowing strongly during winter. Finally, the hardened surfaces and development adjacent to the canal means that when the canal overflows, it causes significant damage and creates a hazardous environment.

A local civic organisation played a significant role in encouraging authorities to divert water from the main canal, into a series of small ponds, forming miniature wetland areas parallel to the canal.

These miniature wetlands make environmental 'sense' because:

- The water flowing into the wetlands is temporarily held in the ponds. These ponds therefore act as retention dams, which can help reduce the risk of flooding during the winter.
- Plants growing in the wetlands take up nutrients that have settled out of the water and into the soils. This helps purify the water.
- The plants growing in the wetland provide habitat for insects and other organisms, and attract birds. This provides an opportunity for some of the natural environment to be restored in the urban area.
- The wetlands and birdlife provide a more scenic route for pedestrians. More people then use the pathways, and this in turn leads to a reduction in those criminal activities typically associated with deserted or lonely areas.

Understanding the value of wetlands, and encouraging people to use the pathways amongst the miniature wetlands requires the provision of information and ongoing awareness-raising and management.



Wetlands are an example of a key environmental factor that should inform development in Khayelitsha and Mitchell's Plain. The URSDF should therefore consider how this environmental parameter can be incorporated into:

- the promotion of a decentralised range of opportunities and convenient local facilities;
- the creation of physical linkages and development between Mitchell's Plain and Khayelitsha and their connection via transport routes to enable their integration within the city;
- the enhancement of natural environmental assets.
- the creation of local level, safe, multifunctional public spaces.

The EMF aims to promote sustainable development through screening and informing development proposals for Khayelitsha and Mitchell's Plain.

Evaluation of Urban Renewal programmes, plans or projects through the EMF should assist in:

- (i) Facilitating the development process by streamlining the Environmental Impact Assessment (EIA) process as required in terms of the EIA Regulations promulgated under the Environment Conservation Act, Act 73 of 1989 (Government Notice No R1183 published on 5 September 1997); and
- (ii) Facilitating the monitoring and auditing of the roll out of the URP
- (iii) Improving the sustainability of development.

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APPENDICES

APPENDIX 1
ENVIRONMENTAL CONSERVATION ACT
(73/1989)
EIA REGULATION
‘LISTED ACTIVITIES’

APPENDIX 2
FLOODPLAIN MANAGEMENT
GUIDELINES

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GLOSSARY

GLOSSARY

Air Pollution events: The days when air pollution levels go over the limits set in recommended guidelines.

Alien species: Plants and animals, which do not occur naturally in an area – they are brought in by humans. Alien plants often force *indigenous species* out of the area. Rooikrans is a good example of alien species in the Cape.

Aquifer: Rock formations under the ground that carry water – this water can be recovered and used for washing and cooking.

Assessment: A study to carefully check something.

→ See *Environmental Impact Assessment*

Biodiversity: The rich variety of plants and animals that live in their own *environment*. *Fynbos* is a good example of rich biodiversity in the Cape.

Biodiversity corridor: A natural linear area that connects ‘green’ elements of the landscape so as to ensure that flows/fluxes are maintained within a larger spatial process. A biodiversity corridor should provide for movement of species and organisms along and between ecosystems, which is an essential process for maintenance of biodiversity at the landscape level. Whereas the biodiversity node is essentially a planning unit, the biodiversity corridor is more of a spatial concept informing a management approach.

Biodiversity node: Discrete and circumscribed spatial objects usually identified by cadastral parcels of land or which have a clearly defined edge and can be made up of one or a number of Natural Habitat Remnants or wetlands in close proximity presenting a concentration of conservation-related opportunities. They are essentially areas to attract and maintain biodiversity.

Biota: The living organisms (animals and plants) in an area.

Development: The *process* of changing something so that it moves forward, improves or grows.

→ See *Economic development* and *Environmental development*

Ecological buffer: A strip of land adjacent to a water course, wetland or vlei desirable for the protection of aquatic and riparian ecosystems.

Ecosystem: A system involving the relationships and interactions between plants, animals and the non-living *environment*.

Ecotourism: Planning and managing tourism in a way that is sensitive to the *natural environment*. Ecotourism also involves helping the *natural environment* to be sustained by the economic benefits of tourist activities, e.g. camping facilities, hiking, horse trails, and game-watching.

Emissions: Discharging or sending out of substances or fluids, e.g. car fumes.

Encroachment: An intrusion or infringement

Environment: Our surroundings, including living and non-living elements, e.g. land, soil, plants, animals, air, water and humans. The environment also refers to our built, social and economic surroundings, and our effect on our surroundings.

Environmental Impact Assessment (EIA): A scientific study of the likely effect on the *environment* of proposed activities or development. EIAs help bodies like local authorities to decide if they should accept proposals, e.g. to develop a piece of land for housing.

Environmental Management: Making sure that *environmental* concerns are included in all stages of *development*, so that *development* is *sustainable*.

Environmental Management Framework (EMF): Assesses and documents the environmental attributes of a defined geographical area in order to enable informed decisions regarding the need for environmental authorisation in respect of specific activities.

Environmental Sustainability: Maintaining the *environment* in a responsible way to keep it healthy for future generations.

Faecal coliforms: These are a sub-group of *coliform bacteria* and are more accurate indicators of faecal *pollution* due to their growth at high temperatures.

Floodlines: A line on a map or drawing depicting water levels likely to be reached by a flood having a specified recurrence interval

Floodplains: Flat area next to rivers, made up of soils deposited during flooding.

Hazardous Waste: Waste that is a threat to the well-being of people, plants and animals, e.g. hazardous waste from factories, detergents, pesticides and vehicles.

Hydrology: The properties, distribution and circulation of water on Earth.

Indigenous Species: Plants and animals that are naturally found in an area.

Integrated: Mixing or combining all useful information and factors into a joint or unified whole.

→ See *Integrated Environmental Management*

Integrated Development Plan (IDP): A plan for development of the City of Cape Town that considers and combines all important elements and factors, e.g. land use planning, economic development, public investment and the monitoring of performance.

Integrated Environmental Management (IEM): A way of managing the *environment* by including *environmental* factors in all stages of *development*. This includes thinking about physical, social, cultural and economic factors, and consulting with all the people affected by the proposed developments.

Integrated Metropolitan Environmental Policy (IMEP): The *environmental policy* developed for the *City of Cape Town area*. The IMEP is a good example of *Integrated Environmental Management*.

Landfills/Landfill site: Places like quarries and mines, used for disposing household and industrial waste, and *hazardous waste*.

Metropolitan Open Space System (MOSS): A planned *network* to ensure open spaces in cities and towns to facilitate conservation, agriculture and recreational and cultural enjoyment.

Recurrence interval: The average interval between flood events of specified severity

Sensitive: A component or aspect of the environment which is vulnerable to change due to various development activities. The changes could bring about negative environmental and socio-economic effects. Sensitivity refers to the vulnerability of the component to change. In this report, components/aspects that are of high and medium sensitivity must be considered early in the planning and development process.

Sewage: Household or industrial liquid waste that is carried away in sewers and drains.

Situation assessment: A description of the baseline environmental status quo (or situation) in the urban renewal area.

Socio-economic environment: The part of the *environment* that is linked to human activities (e.g. social, economic, cultural and political *processes*). Themes that form part of the socio-economic environment are: the economy, health, education, safety and security, and *environmental governance*.

Stakeholders: People and organisations that are involved or interested in an area or an issue, e.g. residents, councilors, business people, trade unions.

Storm water system: Constructed and natural facilities, including pipes, culverts and watercourses, whether over or under public or privately owned land, used for and required for management, collection, conveyance, temporary storage, control, monitoring, treatment, use and disposal of stormwater.

Storm water: Water resulting from natural precipitation and/or the accumulation thereof and includes groundwater and spring water ordinarily conveyed by a storm water system, as well as sea water within estuaries, but excludes water in a drinking water or waste water reticulation system.

Storm water drainage: System of underground pipes that removes rain and other water from the ground, roads and roofs to rivers, lakes and sea.

Strategic issues: Issues which are key to the sustainable development of Khayelitsha and Mitchell's Plain. If these issues are not taken into consideration in planning and development of the urban renewal area, there will be significant environmental impacts which will have wide ranging socio-economic repercussions.

Sustainability: Being able to meet the needs of present and future generations by the responsible use of *resources*.

Sustainable development: *Development* that is planned to meet the needs of present and future generations, e.g. the need for basic *environmental*, social and economic services. Sustainable development includes using and maintaining *resources* responsibly.

Unicity: The one-city political and administrative Council that united the CMA's seven local government structures as "the *City of Cape Town*" from the December 2000 local elections.

Watercourse:

- (a) A river, stream, channel, or canal in which water flows regularly or intermittently; and
- (b) A vlei, wetland, dam or lake into which or from water flows.

Wetlands: An area of land with water mostly at or near the surface, resulting in a waterlogged *habitat* e.g. vleis, swamps.