



DRAKENSTEIN

MUNISIPALITEIT • MUNICIPALITY • UMASIPALA

Paarl | Wellington | Gouda | Saron | Simondium

DRAFT ENVIRONMENTAL MANAGEMENT FRAMEWORK FOR THE DRAKENSTEIN MUNICIPALITY AREA

JANUARY 2022



**Western Cape
Government**

A city of excellence

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LIST OF ACRONYMS

| Acronyms | Definition |
|--------------------------|---|
| AQMP | Air Quality Management Plan |
| BA | Basic Assessment |
| CBA | Critical Biodiversity Area |
| CESA | Critical Ecological Support Area |
| City of Cape Town | City of Cape Town Metropolitan Municipality |
| CR | Critically endangered |
| CWDM | Cape Winelands District Municipality |
| DEA | Department of Environmental Affairs (formerly DEAT) |
| DEA&DP | Department of Environmental Affairs and Development Planning |
| DEAT | Department of Environmental Affairs and Tourism |
| DFFE | Department of Forestry, Fisheries, and the Environment (formerly DEA) |
| Drakenstein | Refers to the Drakenstein Municipality and the geographical area under its jurisdiction |
| DWA | Department of Water Affairs (formerly DWAF) |
| DWS | Department of Water and Sanitation (formerly DWA) |
| EAP | Environmental Assessment Practitioner |
| EIA Regulations | Environmental Impact Assessment Regulations promulgated in terms of the National Environmental Management Act |
| EIIF | Ecological Infrastructure Investment Framework |
| EIA | Environmental Impact Assessment |
| EIR | Environmental Impact Report |
| EMF | Environmental Management Framework |
| EMZ | Environmental Management Zone |
| EN | Endangered |
| FEPA | Freshwater Ecosystem Priority Area |
| GDP | Gross Domestic Product |
| GIS | Geographical Information Systems |
| GNR | Government Notice |
| HDI | Human Development Index |
| I&APs | Interested and Affected Parties |
| IDP | Integrated Development Plan |
| IWMP | Integrated Waste Management Plan |
| LEDS | Local Economic Development Strategy |
| MSA | Local Government: Municipal Systems Act (Act 32 of 2000) |
| MUCP | Management Unit Control Plan |
| MEC | Member of the Executive Council |
| NDP | National Development Plan |
| NEMA | National Environmental Management Act, (Act 107 of 1998 - as amended) |
| NEMBA | National Environmental Management: Biodiversity Act (Act 10 of 2004) |
| NEMPAA | National Environmental Management: Protected Areas Act (Act 57 of 2003) |

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| NFSD | National Framework for Sustainable Development |
| NSSD | National Strategy for Sustainable Development |
| PSDF | Provincial Spatial Development Framework |
| RHP | River Health Programme |
| S&EIR | Scoping and Environmental Impact Reporting |
| SANBI | South African National Biodiversity Institute |
| SANS | South African National Standards |
| SDF | Spatial Development Framework |
| SEA | Strategic Environmental Assessment |
| SEMP | Strategic Environmental Management Plan |
| SoER | State of Environment Report |
| UNESCO | United Nations Educational, Scientific and Cultural Organisation |
| WCBA | Western Cape Biodiversity Act 2021 (Act No.6 of 2021) |

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1. BACKGROUND AND INTRODUCTION

Drakenstein Municipality forms part of the Cape Winelands District Municipality (which also includes the Category B Municipalities of Stellenbosch, Breede Valley, Witzenberg and Langeberg)¹. Drakenstein Municipality is centrally located within the Cape Winelands District Municipality (CWDMM), along the major transport routes (national road and railway) within the Western Cape Province. The Municipality covers an area of 1 538km², and the main towns are Paarl, Mbekweni and Wellington. The other towns include Saron, Gouda, Hermon, Simondium, Windmeul, Bainskloof Village and Klapmuts North. The Municipality stretches from south of the N1 road, in the south, up to, and including, Saron in the north. The Klein Drakenstein, Limiet and Saron Mountain ranges form its eastern edge, and the agricultural area immediately to the west of the R45 creates its western border. Paarl and Wellington are the larger urban centres in the Municipality, which are located in close proximity to the N1 in the south, with smaller rural settlements at Saron and Gouda in the north, and Hermon in the mid-west².

Neighbouring municipalities to the east are Witzenberg and Breede Valley Municipality, both of which also fall within the CWDM. Drakenstein is the second largest municipality in the Western Cape (with the City of Cape Town being the largest) in terms of population. Paarl and Wellington are the main urban centres within the municipality, where most of the economic activity takes place and most of the population resides. Agriculture forms the backbone of the CWDM economy, and the Drakenstein Municipality is regarded as the agricultural centre within the wine and fruit belt.

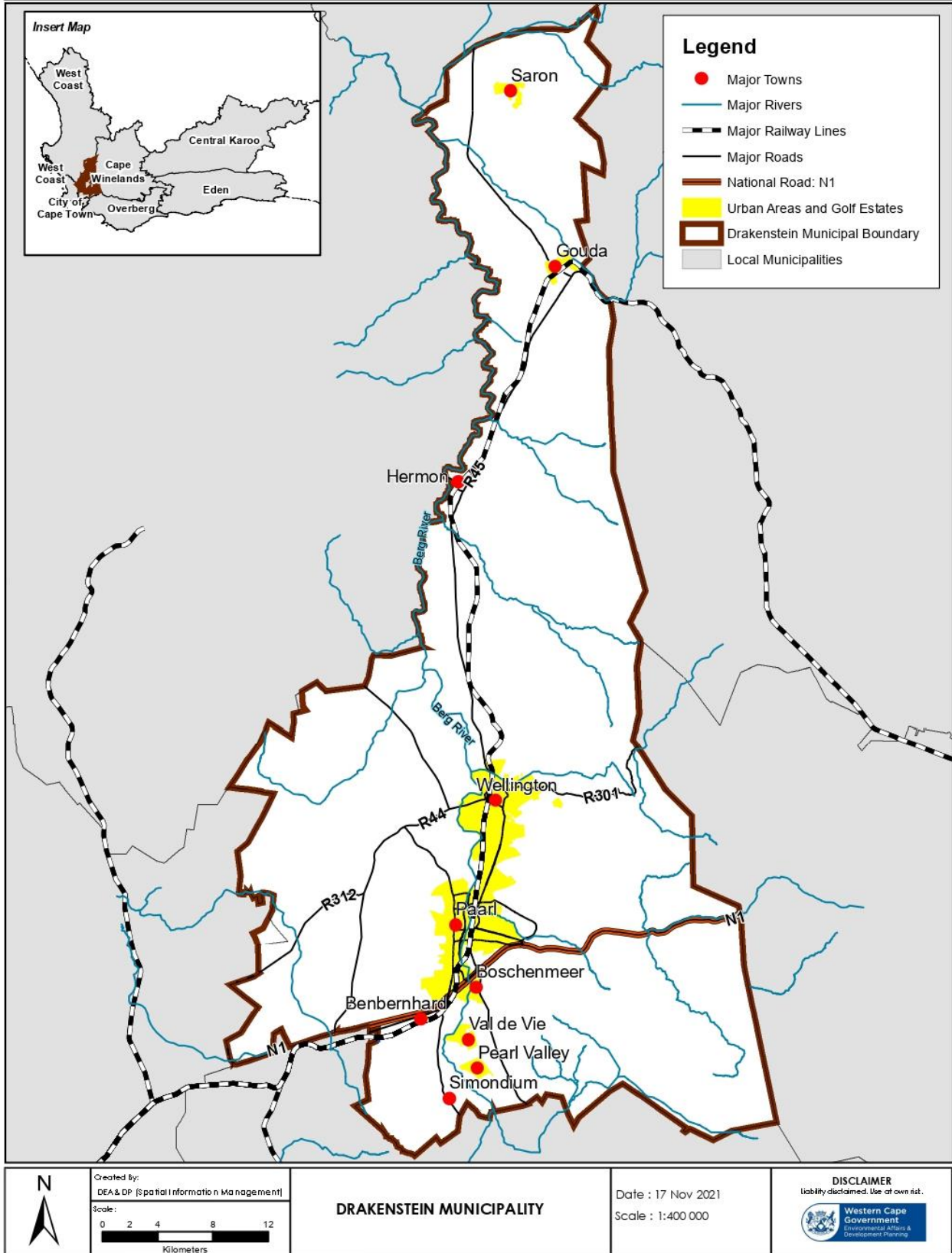
The southern part of the municipality is characterized by vineyards irrigated from the Berg River. Although viticulture is no longer as dominant as it used to be, with other crops such as olives being introduced and other sectors such as manufacturing growing rapidly, the wine and table grape industry is still a major source of income and employment in the area. Agriculture as a sector remains dominant in the Drakenstein municipal area (from here on referred to as “Drakenstein”) both in terms of contribution to the local economy and employment. There are many backward and forward linkages within the local economy that are related to viticulture, particularly in the manufacturing sector such as agro-processing, packaging, fertilisers, and machinery (Boulle and Newton, 2006). Paarl and Wellington are important service centres in the Cape Winelands.

In the northern part of the municipality, the economy is dependent on dry land crops such as wheat and canola. Hermon and Gouda in particular are service centres for agriculture, whilst Saron, established by the Rhenish Missionary Society, is less important in this capacity. The location map (see Map 1) below which illustrates the location of Drakenstein Municipality in relation to South Africa, the Western Cape Province, and also displays the various towns within the area:

¹Page of 31 Drakenstein Municipality: Integrated Development Planning 2021/2026.

²Page of 1 Drakenstein Municipality: Spatial Development Framework 2020/2025.

DRAKENSTEIN MUNICIPALITY EMF GEOGRAPHICAL AREA



MAP I: Drakenstein Municipality EMF Geographical Area

1.1 Environmental Management Frameworks – An Overview

A primary objective of an EMF is to support environmental decision-making, not only for environmental authorities such as the DEA&DP, but also for other authorities whose decisions could have environmental implications. It is particularly important to have close liaison with the municipality during the development of the EMF.

The National Environmental Management Act (Act 107 of 1998, as amended) commonly referred to as NEMA is a framework law that gives effect to the environmental right in the Constitution³. Chapter 5 of NEMA sets out the objectives of integrated environmental management and provides, among other things, for the listing of activities that may not commence without an environmental authorisation. Section 24 (which forms part of Chapter 5) of NEMA states that in order to give effect to the objectives of integrated environmental management, the potential impact on the environment of listed activities must be considered, investigated, assessed, and reported on to the competent authority charged with granting environmental authorisations⁴. The process of doing so is commonly referred to as environmental impact assessment (EIA). Section 24 also allows the Minister responsible and the Members of the Executive Councils responsible for environmental affairs (MEC), to compile *“information and maps that specify the attributes of the environment in particular geographical areas, including the sensitivity, extent, interrelationship and significance of such attributes...”*⁵

The EIA Regulations gave further effect to section 24 when it came into effect on 3 July 2006 (GN 385, 386 and 387 of 21 April 2006). These Regulations replaced those promulgated in 1997 under the Environment Conservation Act (Act 73 of 1989). The “information and maps” referred to in section 24(3) of the Act were defined in the 2006 EIA Regulations as an EMF. Chapter 8 in the 2006 EIA Regulations dealt with EMFs. The 2006 EIA Regulations were repealed and replaced with the 2010 EIA Regulations, which came into effect on 3 July 2010 (GN 543, 544, 545 and 546 of 18 June 2010). These Regulations included, for the first time, a Listing Notice 3 which included various activities in sensitive locations as specified by the respective provinces. In addition to Regulations relating to EIAs, EMF Regulations were promulgated separately (GN 547 of 18 June 2010).

The 2010 EIA Regulations have been repealed and replaced with the 2014 EIA Regulations (Government Notice (GN) R 982, 983, 984 and 985 of 4 December 2014). These new regulations came into effect on 8 December 2014. In addition, Exemption Regulations (GNR 994 of 8 December 2014) and Appeal Regulations (GNR 993 of 8 December 2014) were also published. Further amendments to the EIA Regulations, 2014 came into effect on 7 April 2017.

³ See section 24 of the Constitution of the Republic of South Africa, 1996.

⁴ Section 24(1) – This is typically the environmental authority (provincial or national) or any other Minister as specified in the EIA Regulations published in terms of section 24 of NEMA.

⁵ Section 24(3) of NEMA.

1.1.1 What is the legal standing of an EMF?

This section deals with the question of whether there is a legal obligation to implement and adhere to an EMF. The legislation states the following:

1. Section 24(3) of NEMA: *“The Minister, or an MEC with the concurrence of the Minister, may compile 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 competent authority.”*⁶
2. Section 24(4)(b)(vi) of NEMA: Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must include, with respect to every application for environmental authorisation, the *“consideration of environmental attributes identified in the compilation of information and maps contemplated in subsection (3)”*. This creates an obligation for an applicant to consider any applicable EMF when investigating, assessing, and communicating to the competent authority the potential impacts of activities on the environment. The EMF Guideline, 2012, prepared by the Department of Environmental Affairs (DEA - formerly DEAT) states that *“EMFs provide applicants with an early indication of the areas in which it would be potentially appropriate to undertake an activity”*.
3. Section 24(4)(b)(v) of NEMA: In terms of this section the competent authority must consider all relevant factors, which may include *“any information and maps compiled in terms of section 24(3), including any prescribed environmental management frame-works, to the extent that such information, maps and frameworks are relevant to the application”*. Arguably, where an EMF has been drafted, this should be considered to be a “relevant factor” and must accordingly be considered.
4. Regulation 2(1)(c) of the 2010 EMF Regulations: When considering an application for an environmental authorisation the environmental authority is required to (i.e., must) take an EMF into consideration.
5. Regulation 5 of the 2010 EMF Regulations: An EMF may be adopted by the MEC in concurrence with the Minister⁷. Where an EMF has been adopted it must be considered in the consideration of applications for environmental authorisation in or affecting the geographical area to which the framework applies.⁸ The Regulations also allow for EMFs to be considered even if not adopted by the MEC in concurrence with the Minister⁹ but the terminology used in this case is less definitive, as follows: *“may be taken into account in the consideration of environmental applications”*.

⁶ “competent authority”, in respect of a listed activity or specified activity, means the organ of state charged by this Act with evaluating the environmental impact of that activity and, where appropriate, with granting or refusing an environmental authorisation in respect of that activity;

⁷ Regulation 5(1) of the 2010 EMF Regulations

⁸ Regulation 5(2) of the 2010 EMF Regulations

⁹ Regulation 5(3) of the 2010 EMF Regulations

In summary, in the case of the competent authority responsible for environmental obligations, the EMF must be considered if it is an adopted EMF in terms of regulation 5(1) of the 2010 EMF Regulations. Similarly, in undertaking EIA processes, EAPs must consider proposed developments in the context of the EMF. Such consideration should be explicitly indicated in the reports. Although there is no specific obligation placed on other organs of state to apply or use EMFs in their planning and decision-making processes, section 2(1) of NEMA does state that: “the principles set out in this section apply throughout the Republic to the actions of all organs of state that may significantly affect the environment.” In instances where an EMF is in place, this should assist an organ of state in taking account of the NEMA principles in relation to actions that could have a significant environmental impact.

1.1.2 What is the purpose of an EMF?

Given the relatively broad definition of “environment” in NEMA as well as the growing recognition that the development path of the country needs to be shifted onto a more sustainable footing, EMFs must be used to support the goal of sustainability. This is acknowledged in Regulation 2(3) the EMF Regulations as follows (Regulation 2(3) where it is stated that EMFs are aimed at (a) promoting sustainability; (b) securing environmental protection; and (c) promoting cooperative environmental governance.

Furthermore, in terms of section 24(2)(b) and (c) EMFs are also intended to assist the environmental authorities in determining the following:

- Whether there are any activities within the geographical area that may not commence without environmental authorisation in light of environmental attributes (section 24(2)(b)). These are referred to as specified activities.
- Whether there are any activities within the geographical area that may be excluded from having to obtain environmental authorisation in light of environmental attributes (section 24(2)(c)), in which case such activities must meet required norms and standards (section 24(2)(d)).

In summary, therefore, the objectives of the EMF are to provide:

1. A framework to facilitate the pursuit of a sustainable development path in the geographical area with which it is concerned, specifically in relation to land use and development.
2. A comprehensive and integrated information base on the environmental attributes of an area and their sensitivity, together with management information in respect of these attributes (e.g., limits of acceptable change, thresholds, management objectives).
3. A tool to support the identification of issues that require consideration/investigation in an EIA process through referring to the information base of environmental attributes.
4. A decision-support tool for environmental authorities when considering environmental applications in terms of section 24 of NEMA and the associated EIA Regulations.
5. Guidance to applicants with respect to the appropriateness of development or land use proposals and to any professionals that are assisting in the application process, particularly in the environmental and planning fields.

6. Assistance and support to other authorities in the consideration of environmental factors in their decision-making processes, especially where these are concerned with the use of land and resources.
7. Support for cooperative governance, particularly as regards land and resource use planning and development.

An EMF comprises a set or compilation of information maps showing the environmental attributes or characteristics of an area. These maps must show information that is important for planning of development and for decision-making purposes about land use and development. The main purpose of an EMF is to support the competent environmental authority, which in the Western Cape is the DEA&DP, in making their decisions in terms of the EIA Regulations. It must also be considered by the DFFE or any other authority that may be designated as the competent authority for certain Listed Activities and where the application falls within an area for which an EMF has been prepared.

Ideally, the EMF should also be used by other authorities, especially those that are involved in decisions about the use of land (e.g., municipal rezoning decisions, issuing of “plough permits” by the Department of Agriculture). Thus, the authorities would then be using a common information base and goals, which in turn would support the obligation placed on them to give effect to co-operative governance principles.

It must be borne in mind that the EMF is a strategic-level document and thus it does not replace the need for EIAs to be undertaken for projects. The EMF does not replace the Spatial Development Framework (SDF). Ideally, the SDF and EMF documents should be integrated as far as possible. The EMF is concerned with the environmental attributes of an area and the sensitivity of those attributes, with a view to promoting development that is responsive to the prevailing environmental conditions. In this way the EMF can contribute to the objectives of sustainable development.

From the perspective of projects that are subject to the EIA Regulations, the EMF can assist in:

- Assessing a project in the context of the area/region/landscape within which it is located.
- Screening a project proposal in terms of the environmental attributes applicable to its location to determine:
 - the likely environmental issues and thus specialist inputs required;
 - the appropriateness of the proposed project given the attributes of the site and its surroundings;
 - the alignment of the project with environmental management and sustainability objectives;
 - alternatives for assessment.
- Identifying the factors that need to be considered in formulating a development proposal that is responsive to environmental conditions – proactive planning rather than reactive planning.
- Identifying sensitive areas or characteristics that need to be considered and to which the development proposal should respond in a manner that avoids or at least minimises negative impacts in this regard.

- Establishing the need for environmental authorisation in respect of Listed Activities that are based on their location/position in the landscape. For example, many of the activities in Listing Notice 3 of the EIA Regulations fall into this category and the spatial information on environmental attributes in the EMF provides a reference point for determining whether an environmental application needs to be made or not.

In summary, the EMF is aimed at providing information that can be used by the authorities to support decision-making that will take development in the “right direction.” Similarly, applicants can use the EMF to inform their development proposals. The idea is to find the best possible match between protecting resources (i.e., preventing their loss or degradation) on which humankind depends, whilst taking account of the need for development to address pressing social needs such as poverty and unemployment.

1.1.3 What is the relationship between the EMF, IDP and SDF?

An Integrated Development Plan (IDP) “*must reflect [an SDF] which must include the provision of basic guidelines for a land use management system for the municipality.*”¹⁰ Regulations made under the Local Government: Municipal Systems Act, Act 32 of 2000 (MSA)¹¹ set out the requirements for an SDF, including that it “*must provide a visual representation of the desired spatial form of the municipality...which representation must indicate desired or undesired utilisation of space in a particular area*”¹² and “*must contain a strategic assessment of the environmental impact of the [SDF]*”.¹³ An EMF could, therefore, be used to inform the Strategic Environmental Assessment (SEA) or to “*determine the desired or undesired utilisation of space in a particular area.*”

The provisions of the MSA require that the compilers of IDPs and SDFs consider any information contained in a relevant EMF. This conclusion is based on the general obligations of municipalities, as set out in this Act. Sections 23 and 24 respectively require that a municipality must undertake planning that gives effect to its development duties as set out in the Constitution and to its duties in terms of co-operative government. As far as cooperative governance is concerned, the MSA requires that planning undertaken by a municipality must be aligned with and complement the development plans and strategies of other affected municipalities and other organs of state, which would include EMFs developed by an MEC or the Minister.¹⁴ The constitutional duties of municipalities include:

- that development planning gives progressive effect to the environmental right in section 24 of the Constitution;¹⁵
- that a clean and healthy environment is promoted;¹⁶ and
- that municipalities participate in national and provincial development programmes.¹⁷

¹⁰ Section 26(1)(e) of the Local Government: Municipal Systems Act 32 of 2000.

¹¹ Municipal Systems Regulations (GNR 459 of 25 May 2001).

¹² Regulation 4(i)(ii) of the EMF Regulations.

¹³ Regulation 4(f) of the EMF Regulations.

¹⁴ Section 24(1) of the MSA.

¹⁵ Section 23(1)(c) of the MSA.

¹⁶ Section 152(1)(d) of the Constitution.

¹⁷ Section 153(b) of the Constitution.

The EMF serves primarily as an environmental decision-making tool for the provincial authority (DEA&DP) but can be used by other decision-makers as well. In the light of the general obligations to harmonise planning instruments and to consider environmental considerations referred to above, a municipality that fails to consider an applicable EMF when compiling or reviewing an IDP or SDF fails to consider a relevant consideration. Under these circumstances, the adoption of the SDF or IDP may well be reviewable in terms of the principles of administrative justice.

Thus, the EMF should be used to inform the SDF since environmental resources are fundamental to development planning or determining how land should be used. Accordingly, the EMF could be incorporated into the SDF as an environmental “layer” or series of “layers” thereby informing the identification of areas suitable/unsuitable for particular land uses. The EMZs determined in the EMF should thus directly inform the spatial planning categories in the SDF. The relationship between the IDP, SDF and EMF is discussed in more detail in Part 3 – the SEMP.

The intention is to have one integrated Drakenstein Municipality SDF / EMF in future and significant strides have already been taken. The reason is that it is important to have one vision of sustainable development to promote consistent decision-making. This EMF thus starts to align with the SDF to move closer to an integrated SDF/EMF by including the municipal urban edges and comparing the EMZ’s to the SDF Elements.

The EIA Regulations 2014 define “urban areas” as “areas situated within the urban edge (as defined or adopted by the competent authority), or in instances where no urban edge or boundary has been defined or adopted, it refers to areas situated within the edge of built-up areas” (EIA Regulations, 2014). There is a difference between “urban areas” in terms of the EIA Regulations, 2014 and “urban edges” in terms of the Municipal Systems Act (Act No.32 of 2000) (“MSA”). “Urban areas” in terms of the EIA Regulations may be defined and adopted only by the environmental authorities, while “urban edges” in terms of MSA may only be defined by Municipalities. In 2012, the Department issued a NEMA EIA Circular 1 of 2012 that defined an “interim urban edge, which means “the current extent of urban development including serviced erven and erven for which rezoning approvals have been granted”. This means that erven that were either already lawfully developed as urban development or were already rezoned or lawfully serviced prior to 5 March 2012, are regarded as being within urban areas. The exception is if this Department has adopted different urban areas through the use of, for example, environmental management frameworks. The adoption of the urban edges by the environmental authority based on this EMF will however require further assessment and discussion.

Another consideration is the NEMA. This Act sets out principles that apply to the actions of all organs of state that may significantly affect the environment¹⁸. The principles include that “there must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.” Since the adoption of a development plan is an “action that may significantly affect

¹⁸ Section 2 of NEMA

the environment” the NEMA principles apply to the adoption of plans by organs of state. Thus, development plans such as the SDF should consider any EMF in respect of the area concerned.

The EMF is focused on the environmental attributes of an area. The EMF therefore:

- Recognises that there are important natural resources that need to be retained in order to provide for the needs and ensure the health and well-being of citizens in the municipality in the long-term. These natural resources are important because it is due to their existence that the citizens of the Drakenstein can have clean air, clean/drinkable water, soil in which to grow crops and pollinators that are needed to produce food. Completely undisturbed natural areas such as wilderness areas and conservation areas are also important not only because of the role they play in keeping resources such as water clean, but also because of their role in human well-being (e.g., spiritual, or cultural significance). The benefits that are provided to humankind by nature are often referred to as “ecosystem services.”
- Recognises that there are important cultural and social resources that make an area what it is that are valued by citizens. These contribute to the “sense of place” and “sense of community.” They may also play an important role in the local economy (e.g., tourist attractions).

1.2 Structure of the EMF

This EMF has been structured into three sections or parts:

1. **PART 1: A situation analysis** (or ‘environmental status quo report’): This comprises a synthesis of the existing information, taking account of environmental and land use issues, as well as any important trends. The focus of this section is the provision of a series of maps showing important natural and cultural/social resources and characteristics or attributes – where these resources occur and how sensitive or important, they are.
2. **PART 2: A strategy**
3. **PART 3: A Strategic Environmental Management Plan** which will provide an action plan to achieve the strategy based within the context of the environmental attributes. This plan will cover:
 - Recommendations for the EMZs.
 - Recommendations relating to the integration of the EMF with land use and planning instruments (SDF/IDP, zoning schemes) and other environmental initiatives (State of the Environment report - SoER, Environmental Management Systems - EMS).
 - Recommendations in respect of a monitoring, evaluation, and reporting framework.
 - Provision of a decision-making framework.
 - Recommendations regarding ongoing data gathering requirements.

1.3 Comments on information sources and gaps

An extensive range of documentation and spatial data has been reviewed. The information gathering process involved the following:

- Review of existing reports, policies, relevant studies, and other documentation such as the IDP, State of Environment Reports, studies undertaken on the Berg River, as well as the SDF and IDP for the municipal area. In addition to documents and reports, reference was also made to relevant legislation. Documentation that was used in updating of the EMF is provided in the reference list.
- The obtaining of available spatial information so as to compile an integrated Geographical Information Systems (GIS) database relating to environmental attributes. No primary research was undertaken to verify spatial data or to compile additional GIS information. GIS data was obtained from government departments and from relevant agencies.
- A range of spatial data sources were obtained, and these have been used to develop maps showing environmental attributes and to formulate the EMZs. GIS information has been obtained from the following sources: DEA&DP, Drakenstein Municipality South African National Biodiversity Institute (SANBI)/CapeNature, Cape Winelands District Municipality, Department of Agriculture, Department of Water and Sanitation (DWS), Cape Nature, SANBI. Full details of the GIS information used, and its source will be given in Appendix A (see section 15).
- Meetings/discussions or correspondence with organisations with local knowledge and/or that hold useful data.
- The EMF is based primarily on the best available existing information.
- All of the layers or maps resulting from the GIS information were discussed with the relevant authorities to ensure that the best available and most current information had been used. From a biodiversity information perspective, the starting point was to use the information base that had been compiled for the purposes of the SDF, as no fine-scale plan has been developed for the Drakenstein.
- Spatial depiction of the “interim urban edge”.

1.3.1 Public participation

Another source of information will be of the public participation process. The following activities will be undertaken during the public participation process:

- The advertisement of the EMF project.
- EMF project notification.
- Registration of Interested and Affected Parties (I&APs) etc.

The record of the public participation activities will be given in Appendix B.

- The Cape Winelands District Cape Winelands District Municipality Disaster Management Plan¹⁹ provides some spatial data on risks. Criteria for defining these and the relative significance

thereof (e.g., fire risks) were not available for all risks. Accordingly, where the criteria used to determine the significance of risks were not available, these data were not drawn into the EMF database.

PART 1: SITUATIONAL ANALYSIS

2. ENVIRONMENTAL ATTRIBUTES

The following section focuses on the environmental attributes as required by Section 4 of the EMF Regulations, 2010. Having researched the various information sources available and taking account of the environmental attributes that are central to development planning, the following environmental attributes are addressed:

- a) Biodiversity resources;
- b) Water resources;
- c) Agricultural resources; and
- d) Heritage and cultural resources.

The maps in this section are based on information that is available in the Drakenstein EMF GIS database. More detailed and larger scale views of the data are thus available. The GIS database is available from both the DEA&DP and the Drakenstein Municipality.

2.1 Biodiversity Resources

The Drakenstein Municipality is located within the Cape Floristic Region (CFR), which is one of the six plant kingdoms in the world. Thus, the Drakenstein Municipality incorporates a number of areas that are recognised as being ecologically significant locally, provincially, and nationally. Briefly, these areas can be grouped as: threatened ecosystems, special habitats, protected areas, important areas for the delivery of ecosystem services, and ecological corridors. Vegetation information is commonly used as the key informant in determining the biodiversity significance. In the case of compiling existing data on the biodiversity attributes for the Drakenstein municipal area, a high-level of correlation between significant vegetation types and other species were found. Whilst water resources are discussed in a separate sub-section, rivers and wetlands are a critical element of the biodiversity resource base in the Drakenstein.

2.1.1 Threatened ecosystems

Ecosystems are dynamic complexes of plant, animal and micro-organism communities and their non-living environment, interacting as a functional unit. They can be defined at different scales, from a single vegetation type or community of plants, to a cluster of vegetation types, a wetland or group of wetlands, through to an entire range of mountains. Groups of ecosystems with common bioclimatic

characteristics at a landscape scale are called Biomes²⁰. Ecosystem threat status is indicative of the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function, and composition -- on which their ability to provide ecosystem services ultimately depends. Ecosystems are categorized as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of the ecosystem that remains in good ecological condition relative to a series of thresholds, as well as several other criteria²¹.

Hence, much of the original natural habitat in the Drakenstein Municipality has been converted for agricultural, residential, or urban use. In addition, invasion by alien plants has led (and is continuing to lead) to significant loss of biodiversity and transformation of ecosystems. Poor fire management of the fire-dependent vegetation types has also led to loss of biodiversity. Nineteen terrestrial vegetation types Drakenstein: Currently, the Red List is updated regularly, and the list is dynamic which changes being made when new information becomes available²². Additional maps for the threatened ecosystems illustrating the original and the remaining extent of vegetation (Refer to Map 2).

Table 1: A list of the threatened terrestrial ecosystems of the Drakenstein and changes in vegetation threat status are highlighted in yellow

| Vegetation type | Old Status | (NBA 2018) * Status | Notes |
|---------------------------|-----------------------|-----------------------|--|
| Atlantis Sand Fynbos | Critically Endangered | Critically Endangered | Atlantis Sand Fynbos is narrowly distributed with evidence of ongoing biotic disruption from invasive species and overgrazing. Urban development and cultivation have also resulted in loss of habitat. |
| Boland Granite Fynbos | Vulnerable | Endangered | Boland Granite Fynbos is narrowly distributed with high rates of habitat loss in the past 28 years (1990-2018), and evidence of ongoing biotic disruption from invasive species. |
| Breede Shale Fynbos | Least threatened | Endangered | Breede Shale Fynbos is narrowly distributed with high rates of habitat loss in the past 28 years (1990-2018), and evidence of ongoing biotic disruption from invasive species. Cultivation has also resulted in loss of habitat. |
| Breede Shale Renosterveld | Least threatened | Endangered | Breede Shale Renosterveld is narrowly distributed with evidence of ongoing biotic disruption from invasive species and overgrazing. |

²⁰ Page of 13 Western Cape Biodiversity Spatial Plan Handbook 2017

²¹ Page of 21 Western Cape Biodiversity Spatial Plan Handbook 2017

²² Turner, A.A.(ed.) 2017. Western Cape Province State of Biodiversity 2017. CapeNature Scientific Services, Stellenbosch. ISBN: 978-0-621-45962-3

| | | | |
|---------------------------------------|-----------------------|-----------------------|---|
| | | | Cultivation has also resulted in loss of habitat. |
| Cape Flats Sand Fynbos | Vulnerable | Critically Endangered | Cape Flats Sand Fynbos is narrowly distributed with high rates of habitat loss in the past 28 years (1990-2018), and evidence of ongoing biotic disruption from invasive species. Urban development has been a major cause of loss of habitat. |
| Cape Winelands Shale Fynbos | Vulnerable | Critically Endangered | Cape Winelands Shale Fynbos is narrowly distributed with high rates of habitat loss in the past 28 years (1990-2018), and evidence of ongoing biotic disruption from invasive species and altered fire regimes. |
| Hawequas Sandstone Fynbos | Vulnerable | Least Threatened | Percentage of original extent high and currently well protected. |
| Northern Inland Shale Band Vegetation | Least threatened | Least threatened | Percentage of original extent high and currently fairly well protected. |
| Swartland Alluvium Fynbos | Critically Endangered | Critically Endangered | National land cover and supplementary provincial and metropolitan land cover data show that Swartland Alluvium Fynbos has experienced extensive spatial declines of approximately 70 % since 1750. Swartland Alluvium Fynbos is narrowly distributed with high rates of habitat loss in the past 28 years (1990-2018), and evidence of ongoing biotic disruption from invasive species, overgrazing and altered fire regimes. Cultivation has been a major cause of habitat loss. Due to the highly fragmented nature of this vegetation type and small percentage of its original percentage remaining, it should be treated as Critically Endangered. |
| Swartland Granite Renosterveld | Critically Endangered | Critically Endangered | Observed rates of habitat loss between 1990 and 2018 indicate that by 2040 the geographic distribution of Swartland Granite Renosterveld will have declined by approximately 55 %. National land cover and supplementary provincial and metropolitan land cover data show that Swartland Granite Renosterveld has experienced extensive spatial |

| | | | |
|---------------------------------------|-----------------------|-----------------------|--|
| | | | declines of approximately 83 % since 1750. In addition, this ecosystem is narrowly distributed with high rates of habitat loss in the past 28 years (1990-2018), and evidence of ongoing biotic disruption from invasive species and overgrazing. Due to the highly fragmented nature of this vegetation type and small percentage of its original percentage remaining, it should be treated as Critically Endangered. |
| Swartland Shale Renosterveld | Critically Endangered | Critically Endangered | National land cover and supplementary provincial and metropolitan land cover data show that Swartland Shale Renosterveld has experienced extensive spatial declines of approximately 90 % since 1750. |
| Swartland Silcrete Renosterveld | Critically Endangered | Critically Endangered | Supplementary land cover data from provincial and metropolitan authorities show that Swartland Silcrete Renosterveld has experienced extensive spatial declines of approximately 93 % since 1750. Swartland Silcrete Renosterveld is narrowly distributed with high rates of habitat loss in the past 28 years (1990-2018), and evidence of ongoing biotic disruption from invasive species, overgrazing and altered fire regimes. |
| Western Altimontane Sandstone Fynbos | Least threatened | Least threatened | Percentage of original extent high and currently well protected (although very small distribution). |
| Western Coastal Shale Band Vegetation | Least threatened | Least threatened | Percentage of original extent high and currently fairly well protected. |
| Winterhoek Sandstone Fynbos | Least threatened | Least threatened | Percentage of original extent high and currently fairly well protected. |
| Elgin Shale Fynbos | Critically Endangered | Critically Endangered | Elgin Shale Fynbos is narrowly distributed with high rates of habitat loss in the past 28 years (1990-2018), and evidence of ongoing biotic disruption from invasive species |
| Kogelberg Sandstone Fynbos | Critically Endangered | Critically Endangered | Kogelberg Sandstone Fynbos is narrowly distributed with evidence of ongoing biotic disruption from invasive species |

| | | | |
|-------------------------------|------------------|------------------|---|
| Olifants Sandstone Fynbos | Least threatened | Least Threatened | Percentage of original extent high and currently fairly well protected. |
| Southern Afrotemperate Forest | Least threatened | Least Threatened | Percentage of original extent high and currently fairly well protected. |

There are eleven Threatened Ecosystems in the Drakenstein municipal area: eight Critically Endangered and three Vulnerable vegetation types (Refer to Map 3). The little natural habitat that remains in the lower lying areas of the municipal area is highly fragmented outside of protected areas and classified as either *Critically Endangered or Vulnerable*. This means that every remaining patch (or most) of the remaining vegetation in these categories must be conserved if national conservation targets for the affected vegetation types are to be met. Relatively less threatened vegetation is found in the eastern mountainous parts of the municipality, much of which is protected in provincial nature reserves or mountain catchment areas.

*A note about the NBA 2018 assessment:

- In 2011, the first national list of terrestrial ecosystems that are threatened and in need of protection was published in terms of NEMBA. This list was limited to threatened terrestrial ecosystems and was based on an assessment conducted between 2007 and 2010. The 2011 list of threatened terrestrial ecosystems, and the associated maps, have been used in a wide range of environmental processes to guide decision making and inform biodiversity prioritisation and planning over the last 9 years. Between 2015 and 2018, assessments of ecosystem threat status were comprehensively revised for all realms (terrestrial, marine, inland aquatic and estuarine) through the National Biodiversity Assessment (NBA). The assessment of terrestrial realm followed the IUCN Red List of Ecosystems (RLE) framework, and was based on an updated national vegetation map and new ecosystem condition data, derived primarily from the national land cover 1990–2014.
- The statuses as listed above are currently gazetted for comment prior to legal adoption and may change between now and March 2022.

Legal adoption of the 2018 National Biodiversity Assessment ecosystem statuses and implications for decision-making

NEMBA requires the Minister to review the national list of ecosystems that are threatened or in need of protection at least every five years, and update, such list if necessary. It has been more than five years since the National List of Ecosystems that are Threatened or in Need of Protection has been published by the Minister. A more recent ecosystem assessment has also been completed as part of the National Biodiversity Assessment (2018) (**NBA 2018**). That assessment can be used as the base for a new list of ecosystems that are threatened and in need of protection. The process of adopting the revised list is underway and was published for public comment in 2021. Given that there has been changes to biodiversity since 2011, this EMF uses the NBA 2018 and the draft National List of Threatened Terrestrial Ecosystems 2021 as informants.

The replacement of the first List of Threatened Terrestrial Ecosystems (2011) with the revised list would have implications for environmental impact assessment, environmental decision-making, and biodiversity planning. It is likely that the revised List of Threatened Terrestrial Ecosystems, if adopted by the Minister.

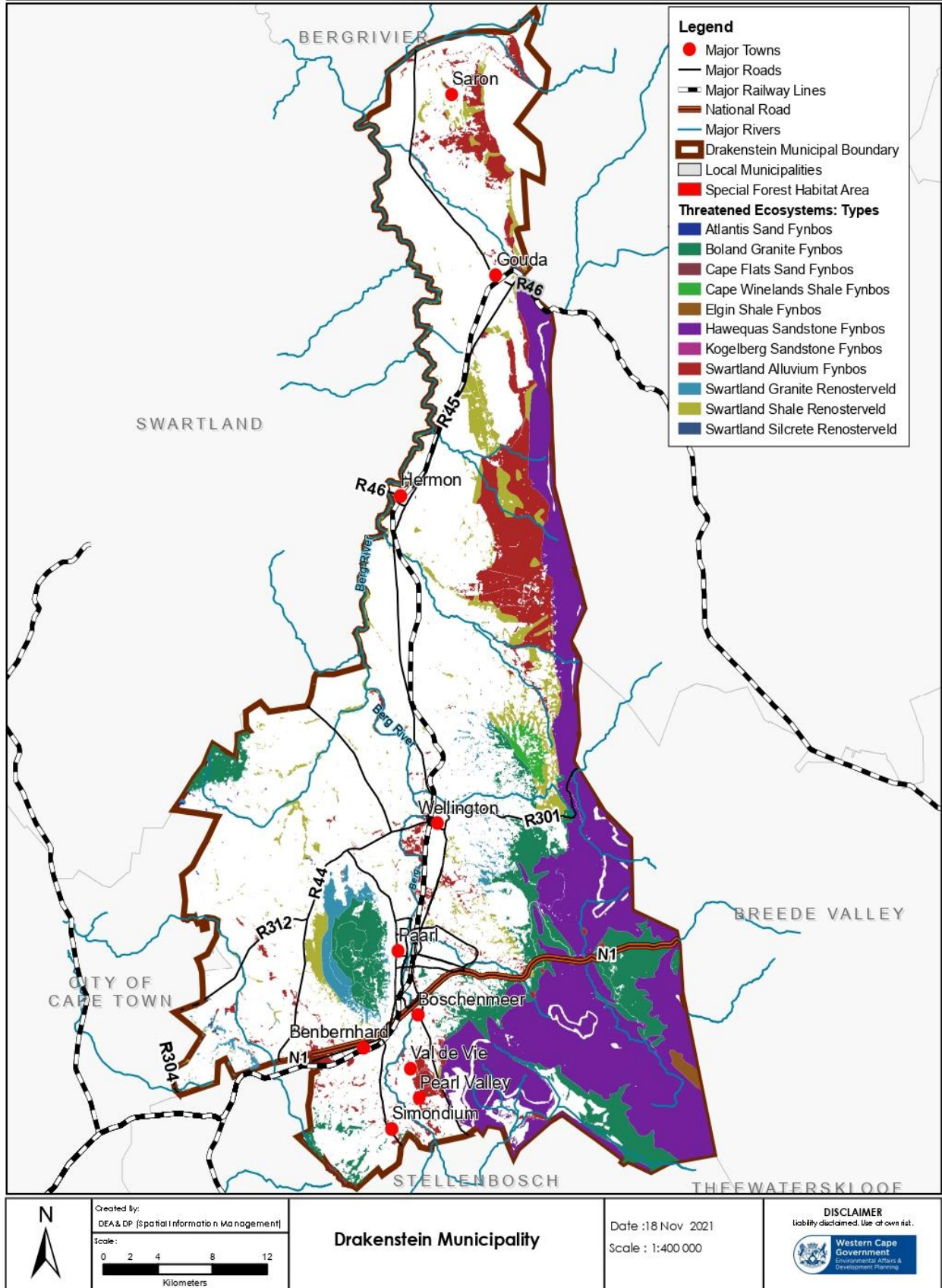
When the revised List of Threatened Terrestrial Ecosystems comes into force, the Critically Endangered or Endangered ecosystems referred to in Listing Notice 3 would be ecosystems identified as such in the revised List. The revised List of Threatened Terrestrial Ecosystems (2021) would not have retrospective effect. This means that the revised List of Threatened Terrestrial Ecosystems (2021) would not affect whether or not environmental authorisation is required for activities that have already commenced.

The list of threatened ecosystems produced as part of the National Biodiversity Assessment (**NBA 2018**) constitutes “other available and relevant information” as contemplated in the Procedures for the Assessment and Minimum Criteria for Reporting on Biodiversity linked to the National Web-based screening tool, and therefore needs to be taken into account by EAPs and CEAs when determining if a specialist report on biodiversity is required as part of an environmental authorisation application, until such time as the revised List of Threatened Terrestrial Ecosystems comes into force.

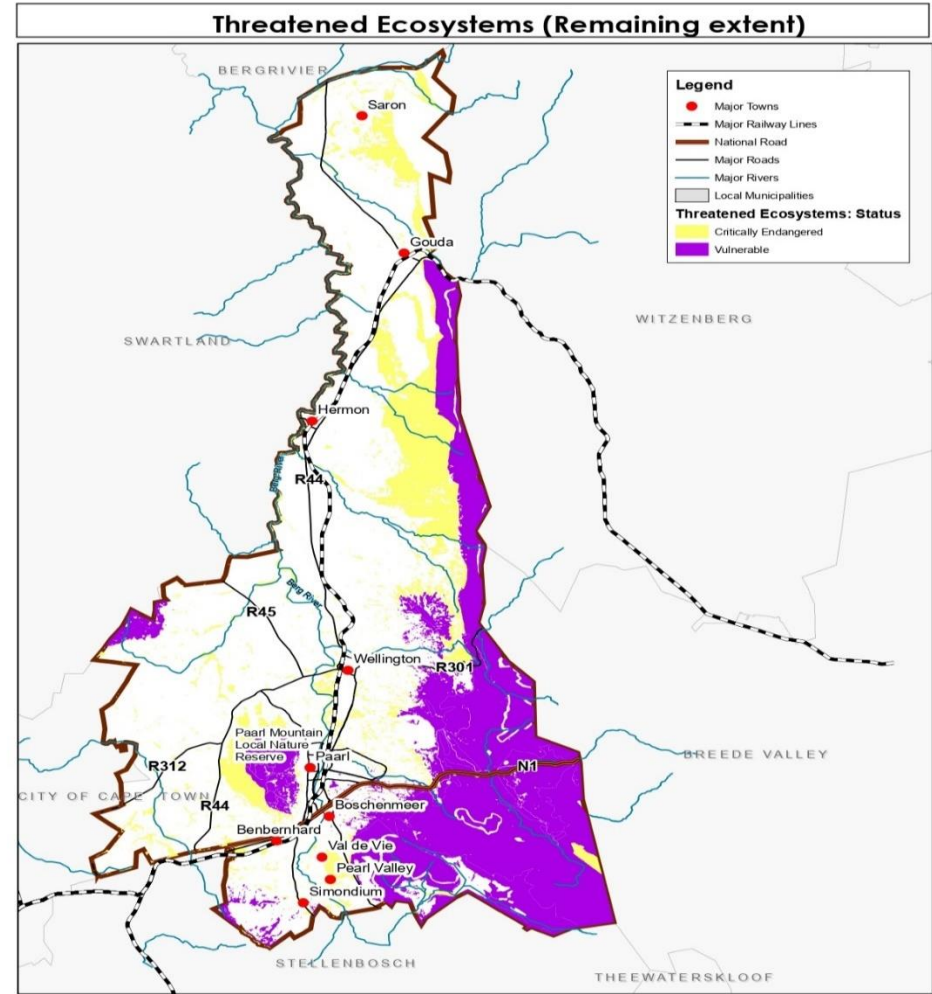
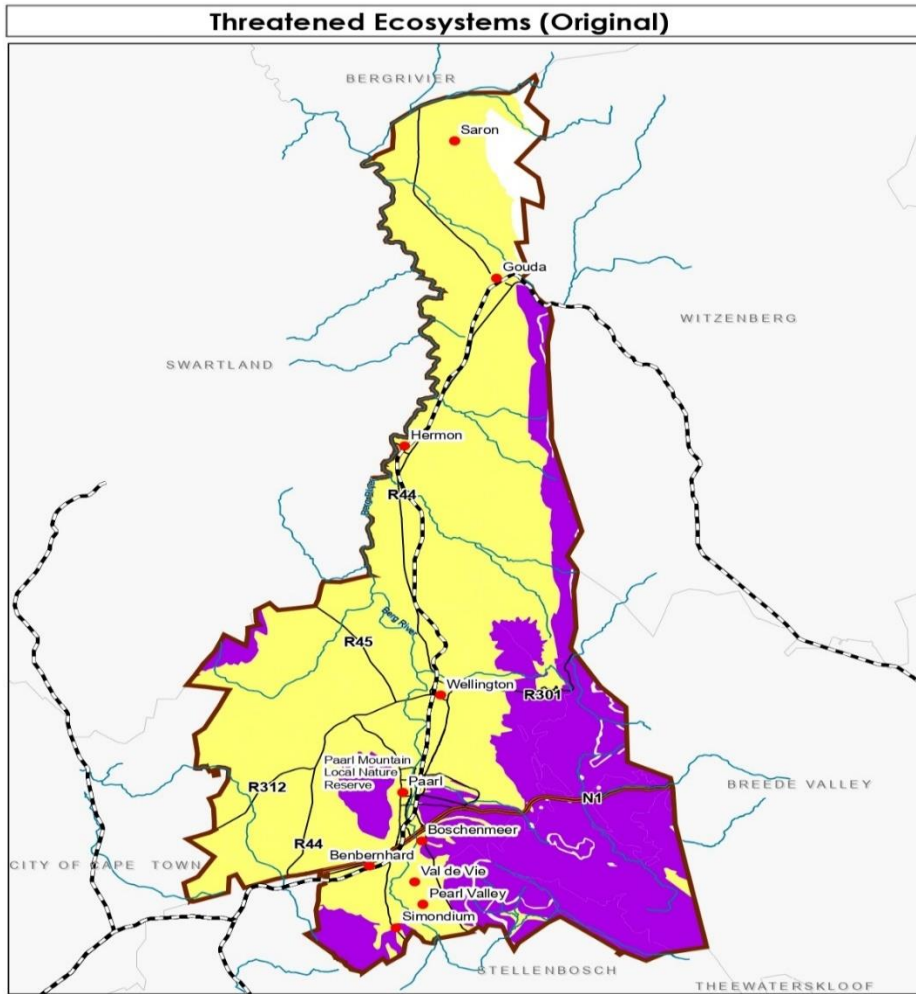
The revised List of Threatened Terrestrial Ecosystems, once it comes into force, would be a relevant factor to be considered in environmental decision-making processes, including decisions in respect of applications for environmental authorisation. The first List of Threatened Terrestrial Ecosystems (2011) would however also be relevant, but to a lesser degree. It could be referred to for the purposes of, for instance, showing a change in threat status of a particular ecosystem. Changes in threat status between 2011 and 2021 should be interpreted carefully as a combination of the method, input data and actual changes in ecosystem condition or state are potential factors for the change in threat status of a particular ecosystem.

A list of the threatened ecosystems published in terms of NEMBA should not be confused with biodiversity priorities identified in systematic biodiversity plans such as CBA Maps. The purpose of a CBA Map is to identify areas that are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole. The purpose of a list of threatened ecosystems published in terms of NEMBA is to identify ecosystems that are at risk of collapse.

Vegetation Types- Remaining extent



MAP 2: Vegetation Types – Remaining Extent



| | | | | | |
|--|--|--|--|---|---|
| | <p>Created by: DEA&DP (Spatial Information Management)</p> | | <p>Drakenstein Municipality</p> | <p>Date : 18 Nov 2021 Scale : 1:350 000</p> | <p>DISCLAIMER Liability disclaimed. Use at own risk.</p> |
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MAP 3: Threatened Ecosystems – Original and Remaining Extent

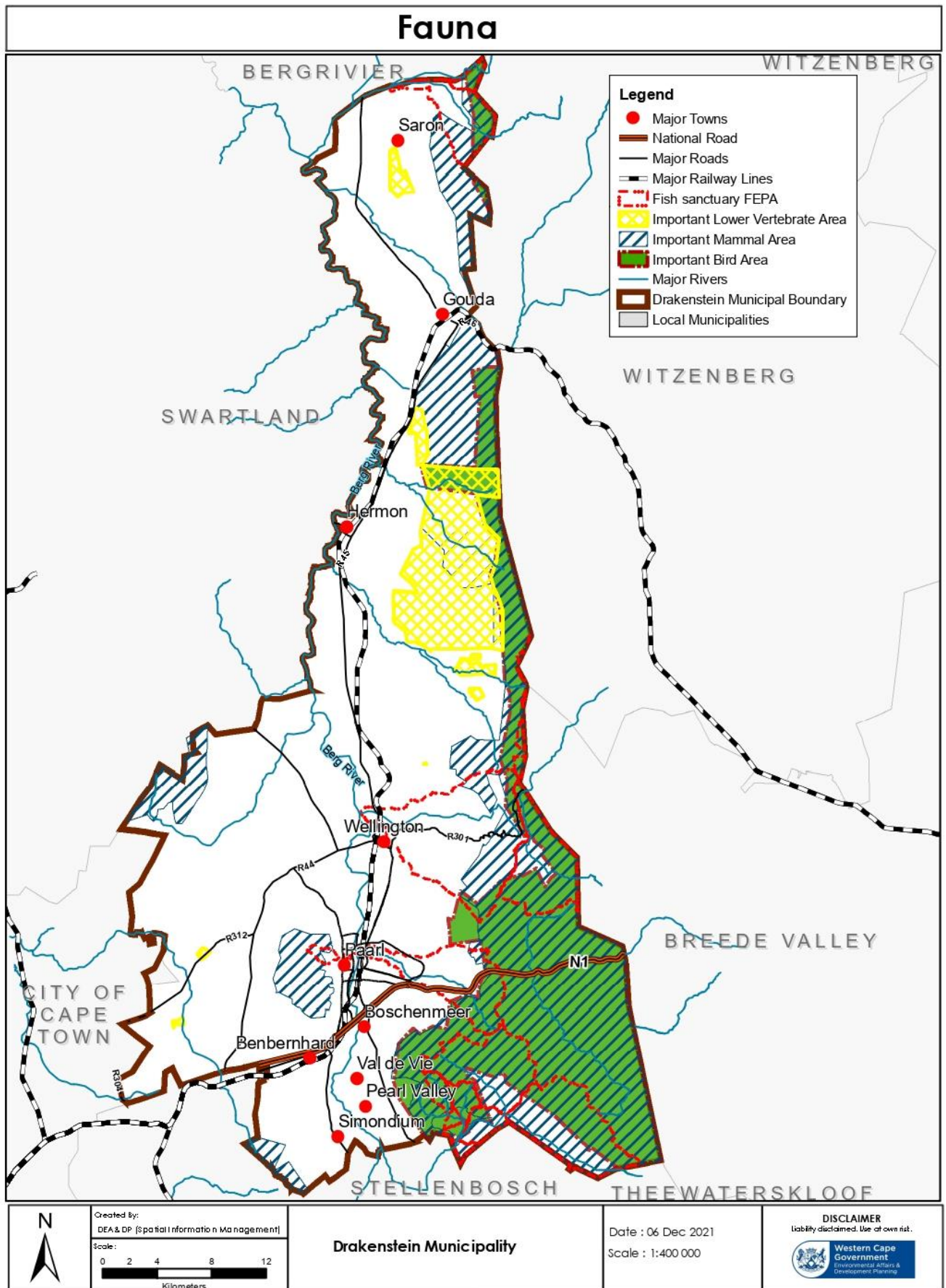
2.1.2 Fauna

Important faunal areas in the study area are shown on Map 4. Much of the indigenous habitat of the Drakenstein, with the exception of mountainous areas, has been converted for agriculture and other uses. The remaining natural areas provide habitat for mammals such as Leopard (*Panthera pardus*), Caracal (*Felis caracal*), Grey Rhebok (*Pelea capreolus*), Cape Grysbok (*Raphicerus melanotis*), Klipspringer (*Oreotragus oreotragus*), Baboon (*Papio ursinus*), Badger (*Mellivora capensis*), Dassie (*Procavia capensis*), Grey Mongoose (*Galerella pulverulenta*), Striped Polecat (*Ictonyx straitus*), Porcupine (*Hystrix africaeaustralis*), and Water Mongoose (*Atilax paludinosus*). Small mammal species include the striped field mouse (*Rhabdomys pumilio*), Namaqua Rock Mouse (*Aethomys namaquensis*), spiny mouse (*Acomys subspinosus*), vlei rat (*Otomys irroratus*) and the elephant shrew (*Elephantulus rupestris*), Cape Clawless Otter (*Aonyx capensis*). Riparian vegetation and river corridors, as well as agricultural lands and remnant patches of indigenous vegetation, permit movement of these animals across the landscape.

According to the State of Biodiversity for the Western Cape there are numerous bird species typical of the Cape mountains, as well as reptiles (including threatened tortoise species such as the geometric tortoise (*Psammobates geometricus*), which is the world's most threatened species of tortoise) and amphibians. The Drakenstein Municipality lies in a region of particularly high frog endemism and moderately high reptile endemism (including species such as the Hawequa Flat-tailed Gecko *Afroedura hawequensis* and Oelofsen's girdled lizard *Cordylus oelofseni*).

Various indigenous and endemic freshwater fish species occur in the rivers; the area is important to indigenous fish conservation. Indigenous fish recorded from the Berg River include the Witvis (*Barbus andrewi*), (endangered) and the Berg River Redfin (*Pseudobarbus burgi*) (endangered). A number of invertebrates are found in the Drakenstein; they include butterfly species, some of which are threatened and/or local endemics found in the mountainous areas²³.

²³ Turner, A. A. (ed.) 2017. Western Cape Province State of Biodiversity 2017. CapeNature Scientific Services, Stellenbosch



MAP 4: Fauna

2.1.3 Protected areas

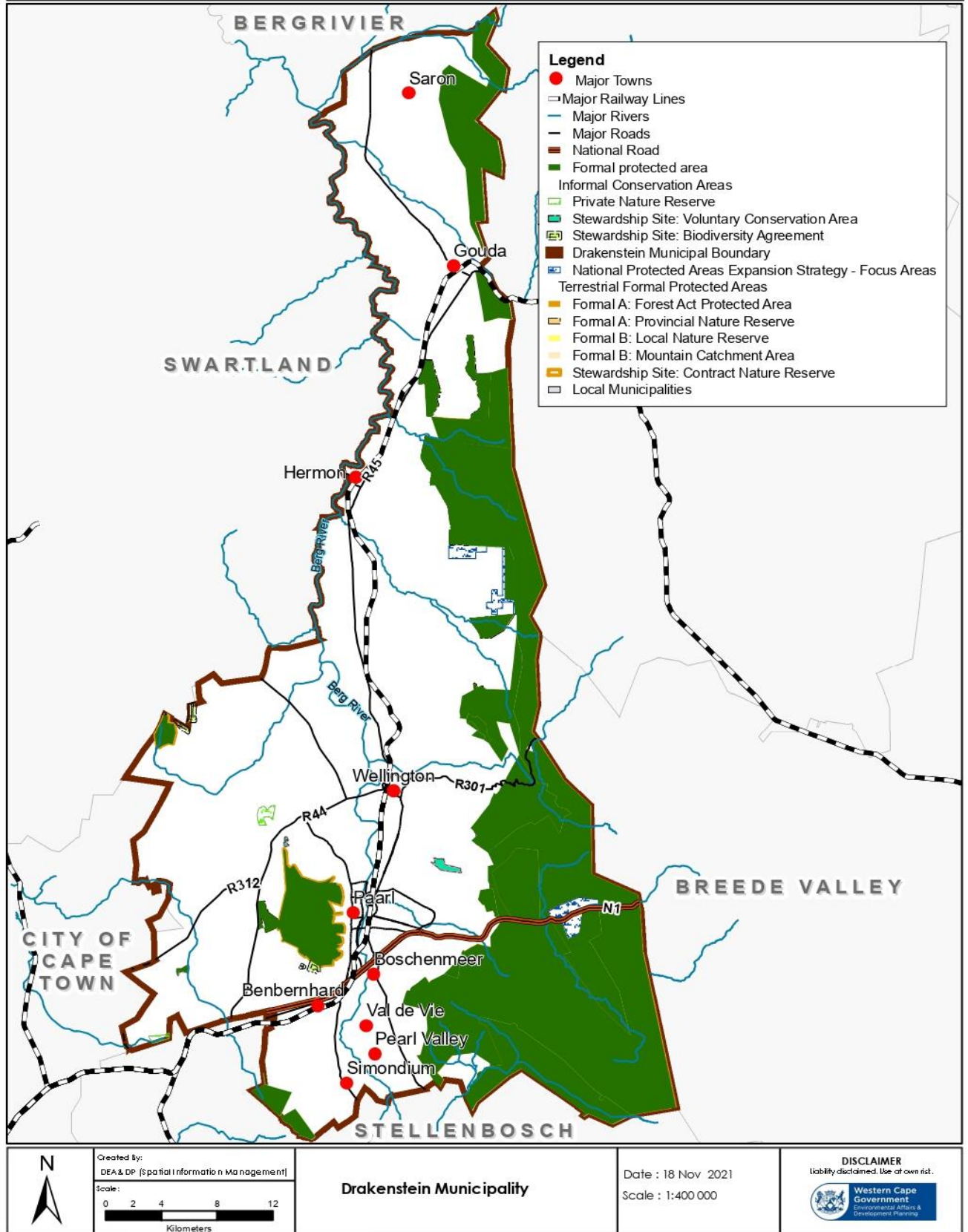
Protected areas and areas managed for conservation in the Drakenstein Municipality comprise (Refer Map 5):

- Five provincial nature reserves lying within, or partially within, the Municipal area: the Limietberg, Groenberg, Groot Winterhoek, Simonsberg, and Waterval Nature Reserves. The Limietberg, Groenberg and Groot Winterhoek Nature Reserves form part of the CFR World Heritage Site.
- One local authority nature reserve: Paarl Mountain Nature Reserve, which has heritage value.
- At least four Contract Nature Reserves established through the stewardship programme, including the Elandsberg Contract Nature Reserve; the largest remaining fragment of renosterveld in a nature reserve globally. Others are the Foxenburg, Renosterveld and Bontebok Ridge Contract Nature Reserves.
- Four private nature reserves: Longerug, Joostenberg, as well as High Slent's Papegaaiberg and Pieters Rivier Private Nature Reserves.
- A number of conservancies, which are voluntary conservation areas.
- The Hawequas, Hottentots-Holland and Winterhoek Mountain Catchment Areas.
- A public bird sanctuary, Kluitjieskraal, which is defined as a state forestry area
- The Paarl Arboretum on the banks of the Berg River.

Management of these reserves differs with the Drakenstein Municipality being the Management Authority of the Paarl Mountain Reserve. The Limietberg, Groenberg, Groot Winterhoek, Simonsberg and Waterval Reserves are managed by CapeNature and the rest of the reserves are managed by the respective landowners.

CapeNature's Stewardship Programme is a vehicle that assists those areas with biodiversity attributes of provincial and national importance and their land managers in establishing protected areas through NEMPAA. The Stewardship Programme also has two other levels of agreements (which do however not result in formal protected areas but are rather conservation areas): Biodiversity Agreements and Conservancies. There are six Biodiversity Agreements and two conservancies located within this municipality.

Formal Protected Areas



MAP 5: Protected Areas

The Western Cape Biodiversity (Act 6 of 2021) defines the Biosphere Reserves as “an area designated for inclusion in the World Network of Biosphere Reserves by the International Coordinating Council of UNESCO’s Man and the Biosphere Programme”²⁴. The Cape Winelands UNESCO Biosphere Reserve was listed in 2007, incorporates this Municipality (Refer Map 6). The Cape Winelands Biosphere Reserve is located 40 kilometers east of Cape Town in the Western Cape Province and the reserve extends northwards from the Kogelberg Biosphere Reserve in the south, along the Cape Fold Belt Mountain Chain and adjoining valleys that constitute the Cape Winelands. The reserve incorporates key portions of the registered Cape Floral Region Protected Areas World Heritage Site (Pool-Stanvliet et al, 2017). At present there are eight biosphere reserves in South Africa, of which four are located in the Western Cape:

- Kogelberg Biosphere Reserve, 103 629 ha;
- Cape Winelands Biosphere Reserve, 322 032 ha;
- Cape West Coast Biosphere Reserve, 387 000 ha;
- Gouritz Cluster Biosphere Reserve, 3 187 893 ha..

Biosphere reserves are much more than **protected areas**. They should not be viewed as islands isolated from its surroundings, but rather as an integral part of a regional planning and development strategy aimed at promoting sustainable development. Physically they contain three elements as follows:

- **Core areas:** are securely protected areas for conserving biological diversity, monitoring minimally disturbed ecosystems, and undertaking non-destructive research and other low impact uses(education) e.g., national parks, nature reserves, world heritage sites and Ramsar sites
- **Buffer zone:** usually surrounds or adjoins the core areas, and is used for cooperative activities compatible with sound ecological practices, including environmental education, recreation, ecotourism and applied basic research; and
- **Transitional area:** contains a variety of agricultural activities, settlements, and other uses in which local communities, management agencies, scientists, non-governmental organizations, cultural groups, economic interest, and other stakeholders work together to manage and sustainably develop the area’s resources.

All biosphere reserves contain one or more protected areas, but what is unique in the biosphere reserves concept is that it extends beyond protected core areas to include the buffer zone and the transition zone. The three functions are to be implemented within a defined landscape which considers land delimitation and proposed zoning along a progression from preservation to sustainable resource use in the form of, respectively, an inner core area, buffer zones and an outer transition zone (Schultz and Lundholm, 2010; Government of South Africa, 2015).

The Western Cape Biosphere Reserves Act (Act 6 of 2011) has been repealed and replaced by inclusion within the Western Cape Biodiversity Act 2021 (Act No.6 of 2021), regulates the drafting of spatial development frameworks (also referred to as framework plans) for all biosphere reserves

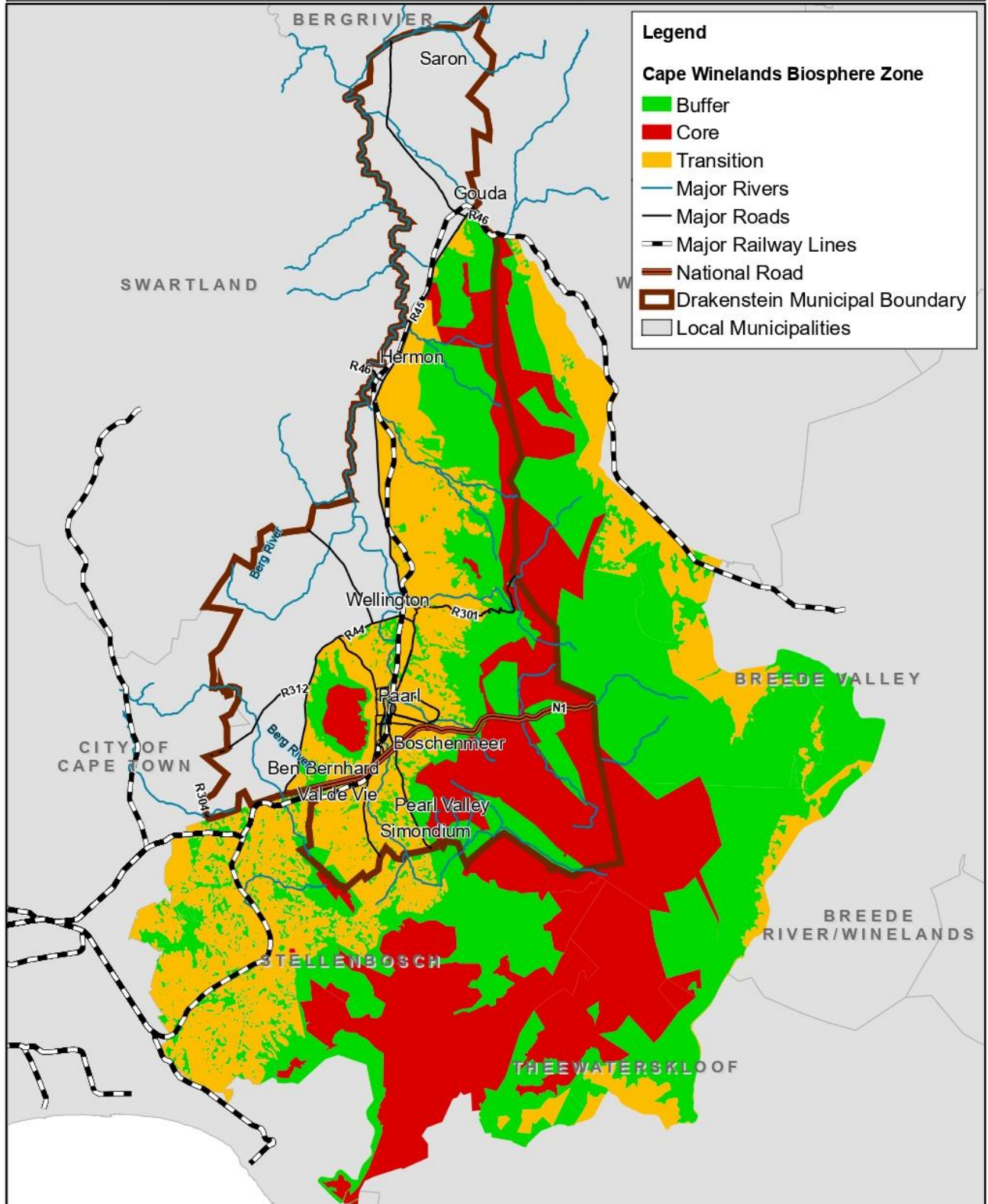
²⁴ Western Cape Biodiversity (Act 6 of 2021)

(Pool-Stanvliet et al, 2017). *“Section 37(2) of the WCBA further state that, the Biodiversity Spatial Plan must inform— (a) the Provincial Protected Area Expansion Strategy and biodiversity stewardship; (b) the identification of ecosystems and ecological infrastructure and the listing of species in terms of this Act and other environmental legislation; (c) land use planning and decision-making; (d) policies and guidelines developed in terms of environmental legislation; (e) any decision-support system, environmental management instrument or strategic environmental assessment developed or used in terms of environmental legislation²⁵”.*

The SDFs need to incorporate the UNESCO prescribed three-tiered zonation system of a biosphere reserve, namely core areas (natural areas with statutory conservation status), buffer areas (near-natural areas that provide a buffering mechanism to the core) and transition areas (incorporating other land uses and promoting sustainable development principles). Biosphere reserve zonation could assist municipalities in developing land use plans, but must be aligned with, and incorporated as part of the municipal IDP and SDF (Schultz and Lundholm, 2010).

²⁵ Section 37(2) of the WCBA

Cape Winelands Biosphere Zones



Legend

Cape Winelands Biosphere Zone

- Buffer
- Core
- Transition
- Major Rivers
- Major Roads
- - - Major Railway Lines
- National Road
- Drakenstein Municipal Boundary
- Local Municipalities

| | | | | |
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MAP 6: Cape Winelands Biosphere Zones

2.1.4 Critical Biodiversity Areas

Information on the conservation status of ecosystems in the Drakenstein, together with an analysis of the size and concentration of, and connections between remaining patches of indigenous vegetation (to gauge their viability in the long term) by CapeNature, was used to derive an Integrated Biodiversity Layer, to determine Known or Likely Critical Biodiversity Areas (CBAs)²⁶.

The Known CBAs comprise areas of Critically Endangered (CR) habitat, in addition to Endangered (EN) and some Vulnerable (VU) habitat having the best patch size, density and connectivity. The Likely CBAs²⁷ comprise both EN and VU habitat of sufficient size, density, and connectivity to be viable in the long term.

There is information on Red Data species available from SANBI. Due to the sensitive nature of these data, it is not possible to show it spatially. Whilst it can be expected that the location of many Red Data species is likely to fall within the known and likely CBAs, it is probable that there are species outside of these areas. Accordingly, SANBI must be consulted while undertaking a baseline study on biodiversity for any vacant/undeveloped land, whether this land falls within a sensitive biodiversity area or not.

2.1.5 Special habitats

Special habitats refer to areas that are unique or that have particular characteristics or features. Four types of 'special habitats' are found at a smaller scale than broad vegetation types or ecosystems, namely:

- Wetlands which are important for regulating water quality and flow and providing particular wildlife habitat;
- Silcrete patches which provide unique habitat for distinct and often endemic biodiversity;
- Indigenous forest patches; and
- Locations that are known to provide habitat for a number of recorded Red Data Book plant species.

2.2 Important areas for the delivery of ecosystem services

Humankind benefits from a multitude of resources and processes that are provided by ecosystems. Collectively, these benefits are known as 'ecosystem services.' Ecosystem services can be divided into: *provisioning* such as the production of food and water; *regulating*, such as the control of climate and disease; *supporting*, such as nutrient cycles, crop pollination and guarding against uncertainty

²⁶ These Known and Likely CBAs have **not** been determined through a Systematic or Fine-Scale Biodiversity Planning exercise. However, their classification is the 'best available' until such planning is carried out in the Drakenstein.

²⁷ Highly likely to be selected as CBAs in any Systematic Conservation Planning exercise, although not all of these would necessarily be selected.

through the maintenance of diversity; and *cultural*, such as spiritual and recreational benefits (MA, 2005).

The areas that are considered most important in terms of ecosystem services within the Drakenstein Municipality are as follows:

1. *Rivers*: The most significant role of rivers is that of water supply. Most of the rivers in the Drakenstein Municipality are degraded due to the impacts of invasive alien fish species, modification of the river banks, clearing of riparian vegetation, invasion of riparian areas with alien plants, development within the floodplain, conversion of valley bottom wetlands, reduction or removal of buffer areas between wetlands or rivers and adjacent land uses, and the cumulative negative effects of chemicals, nutrients and other pollutants in runoff from agricultural lands or settlements and/or releases from intensive aquaculture (especially trout farms).
2. *Wetlands*: are considered to be the most productive and biologically diverse ecosystems in southern Africa. They are also one of the most threatened and neglected habitats. There are numerous so-called 'valley bottom' wetlands in the Drakenstein that play a critical role in trapping sediment, preventing erosion, regulating the release of water, and helping to maintain water quality in rivers; many – if not most – of these wetlands are vulnerable to conversion (or have already been converted) for agricultural production. Most valley bottom wetlands in the Drakenstein area are naturally unchannelled valley bottoms. 'Seepage' wetlands are also common landform features in the Drakenstein area. These are located on relatively steep slopes and are characterised by diffuse, shallow subsurface flow which gives them a high potential for nitrogen and especially nitrate removal. Seepage wetlands also contribute to extending the period of flow in downstream systems, by slowing down the rate of surface and subsurface water movement down the slope.
3. *Mountain catchments*: The Hawequas, Hottentots-Holland and Winterhoek Mountain Catchment Areas were proclaimed to protect habitat critical to a reliable supply of clean water.
4. *Productive soils*: The soils of the Drakenstein underpin agricultural production and contribute to food security, not only in the Drakenstein municipal area, but further afield. That is, their value extends beyond the municipal boundary.
5. *Remaining areas of priority biodiversity*: Areas containing indigenous vegetation provide habitat for pollinators on which agricultural production depends and help to conserve a wide range of living material. The latter effectively safeguards options for our future adaptation and wellbeing.

Ecosystem goods and services are derived from complex nested relationships between both ecological and social systems. The relationships or linkages between ecological components that give

rise to these goods and services is called ecological infrastructure. The Western Cape Government has recently co-developed the Ecological Infrastructure Investment Framework (EIIF) for the Province, which, with landscape stakeholders, sets out the important ecological infrastructure needing protection, as well as the major threats posed to this infrastructure. A central theme of the report is the clearing, management, and eradication of Invasive Alien Plants, but is not limited to this perspective (DEA&DP, 2021)

The EIIF explores overlaps between the various mandates and interests of organisations responsible for elements of ecological management, and then prioritises interventions in a manner that would result in the greatest returns. These prioritised interventions are then filtered down to the Management Unit Control Plan (MUCP), which transposes them in compartments over a catchment area. The MUCPs are invaluable in establishing Annual Plans of Operation around ecological investment, as well as coordinating multiple investors over a geographical and temporal scale.

2.2.1 Ecological corridors

Ecological corridors strive to ensure that key ecological and evolutionary processes at different scales will continue in perpetuity. They create linkages between different ecosystems on land, focusing on attributes that are significant for biodiversity conservation, and between terrestrial and freshwater ecosystems. Streams and rivers with their associated floodplains, wetlands, and riparian habitats, as well as mountain chains, effectively provide natural corridors across landscapes. Ecological corridors extend within and beyond the boundaries of the Drakenstein municipal area. These corridors safeguard 'green' links and may constitute valued open space for recreation and relaxation particularly in the urban areas.

The Berg River provides an important link between the mountains and the sea. Although the Berg River catchment has been extensively developed, and the riparian corridor is in a poor condition, the river nevertheless constitutes a substantial vegetated area through an otherwise largely ecologically sterile, cultivated catchment. In places, therefore, it is probably the only refuge for both remnant riverine and terrestrial fauna. This corridor also provides links between the lowlands and the upper reaches of its tributaries.

Pollution in the Berg River catchment, however, is a cause of great concern especially to communities, farmers, and industry in the various municipalities of the West Coast and Cape Winelands regions. Various stakeholders have implemented initiatives to address the pollution concerns raised. The ultimate aim of the Berg River Improvement Plan is to have a Water Stewardship Programme for the Berg River catchment to change the lives of people through the implementation of simple interventions. The outcome will be a Berg River, where its value for ecosystem services is recognised, and its natural resource state as it relates to water quality and quantity returns, while promoting sustainable growth and development towards a green economy in the Western Cape.²⁸ In addition, an overarching Water Stewardship Programme for the Berg River catchment is proposed for

²⁸ Western Cape Government (2012): A Berg River Improvement Plan. Western Cape.

integrating the Tasks identified in the Berg River Improvement Plan. All Tasks are proposed for completion within a 5–30-year time frame.

The mountain catchment areas and nature reserves (Limietberg, Groot Winterhoek) in the eastern part of the Drakenstein provide a valuable north-south ecological corridor. In addition to river and mountain corridors, it is important to set aside linkages between ecosystems that are a priority for biodiversity conservation, where relevant, and to try to safeguard areas particularly important from an ecological and/or evolutionary perspective. These areas include interfaces between different soil types, transition areas and gradients between upland and lowland areas, as well as macro-climatic gradients.

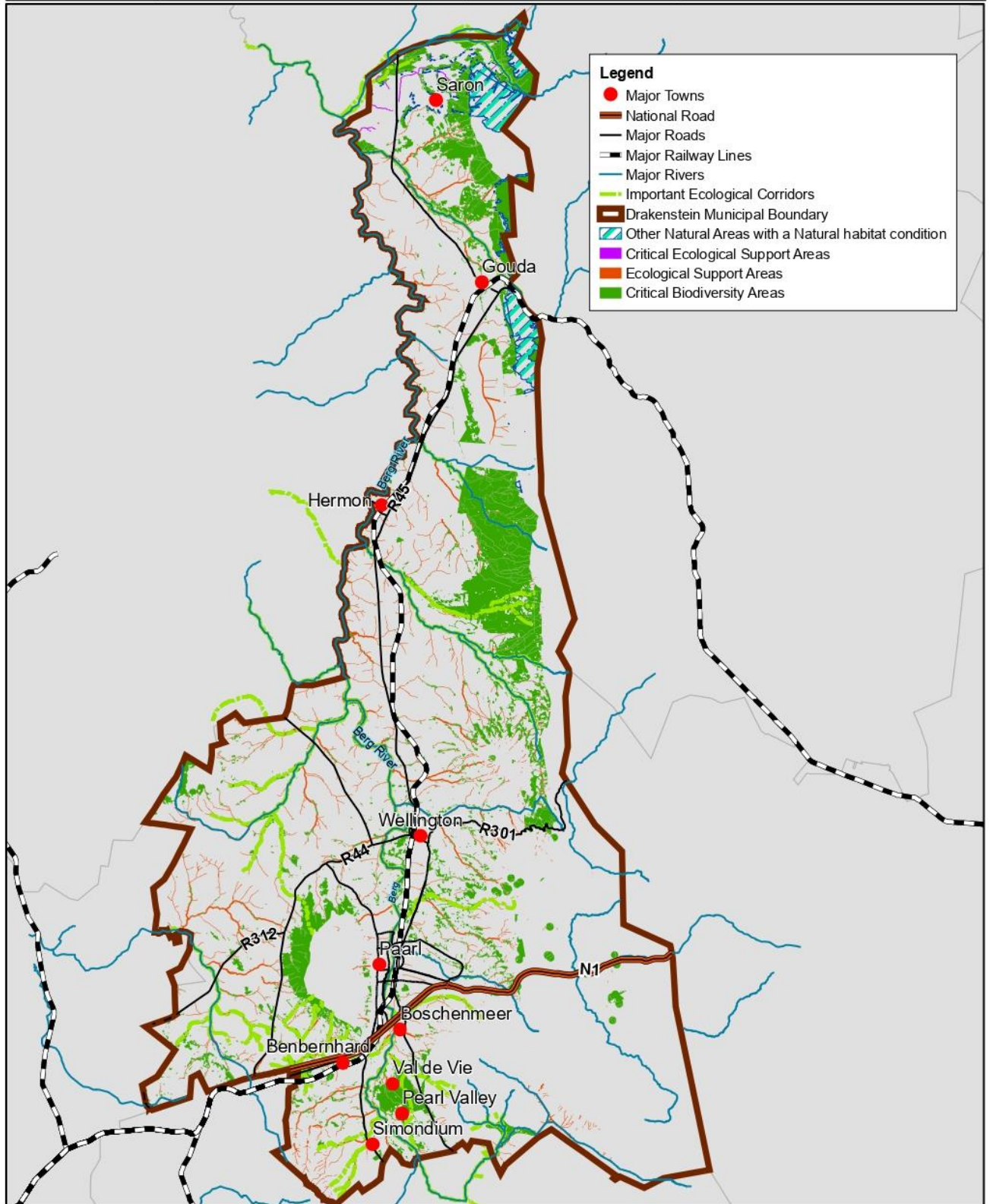
Ecological corridors within the boundaries of the Drakenstein, and linking with important areas for biodiversity conservation beyond the Drakenstein, were identified by taking into account and trying to incorporate and link the various environmental attributes listed below, based on a range of information from the SANBI and CapeNature (integrated biodiversity layer), the Berg River Study (Ninham Shand & Freshwater Consulting Group) and a survey of wetlands in the Drakenstein was conducted by the Freshwater Consulting Group for the Drakenstein EMF, 2015:

- Priority streams and rivers in and beyond the Drakenstein in terms of their role as ecological corridors (1) supporting or linking different freshwater systems of significance, (2) providing longitudinal and lateral corridors for semi-aquatic fauna, and/or (3) providing links with terrestrial areas;
- Protected areas both within and beyond Drakenstein;
- Areas known or likely to constitute CBAs within the Drakenstein and in municipalities beyond the Drakenstein municipal boundary;
- Ecosystem remnants having a high connectivity and density within the Drakenstein and in municipalities beyond the Drakenstein municipal boundary, including Renosterveld priority clusters;
- Special habitats within the Drakenstein, including priority wetlands either associated with, or distinct from, streams and rivers.

The width of corridors draws on recommendations of a number of studies²⁹. The width of river corridors ranges from 30-50m on either side of the river bank depending on its size; and 115m from the centre of the Berg River, wetlands have a buffer of 30m from the edge of the wetland.

²⁹ Biodiversity priorities in the Drakenstein (C.A.P.E., CEPF, CapeNature and the Botanical Society of South Africa); Berg River Catchment Study (in preparation, Ninham Shand and the Fresh Water Consulting Group 2008?)

Important biodiversity and ecological corridors



Legend

- Major Towns
- National Road
- Major Roads
- Major Railway Lines
- Major Rivers
- Important Ecological Corridors
- Drakenstein Municipal Boundary
- ▨ Other Natural Areas with a Natural habitat condition
- ▨ Critical Ecological Support Areas
- ▨ Ecological Support Areas
- ▨ Critical Biodiversity Areas

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| | <p>Created by: DEA & DP (Spatial Information Management)</p> <p>Scale: 0 2 4 8 12 Kilometers</p> | <p>Drakenstein Municipality</p> | <p>Date : 18 Nov 2021</p> <p>Scale : 1:400 000</p> | <p>DISCLAIMER Liability disclaimed. Use at own risk.</p> <p>Western Cape Government Environmental Affairs & Development Planning</p> |
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MAP 7: Important biodiversity and ecological corridor

2.3 Water Resources and River Systems

Surface water is the main source of water in the Drakenstein Municipality, with groundwater playing a lesser role in this regard. A number of rivers traverse the area, the largest of these being the Berg River with the Palmiet, Sand, Dal, Klein Berg, Bot, Twenty-Four, Krom, Kompanjies, Voelvllei and Klapmuts as tributaries. The Berg River rises in the Franschhoek and Drakenstein mountains. Initially it flows northwards through Paarl, Wellington, Hermon and Gouda, where it is joined by the Klein Berg and Vier-en-Twintig rivers. It then flows westwards and its mouth is at Velddrif on the West Coast.

Rivers in the Western Cape are among the most severely threatened in South Africa, with 95% of them assessed as critically endangered meaning that less than 10% of their length is intact (SANBI 2004). With increasing levels of human activity with its associated impacts, rivers become less and less resilient. Wetlands would be similarly affected. As a result, the ability of rivers and wetlands to provide resources and services (i.e., ecosystem services) to human users is reduced. Rivers and wetlands are of critical importance, both for humankind and for the economy. Among others is the provision of water necessary for agricultural, domestic, recreational, and industrial use as well as natural resources such as fish and plant species for human consumption. These systems are also valuable tourism and for cultural resources.

2.3.1 Availability of water resources

Originally, the Berg River was in one of four Water Management Areas (WMA) in the Western Cape, but the number of WMAs have now been reduced and it is now in the Breede-Olifants Water Management Area³⁰. It provides an important source of water for the City of Cape Town (CoCT), Winelands and the West Coast areas. In terms of future water supply planning, the Drakenstein falls within the ambit of the Department of Water and Sanitation (DWS) Western Cape Water Supply System. This planning process considers water supply requirements over a 30-year timeframe. A holistic approach is taken, which means that each supply source is seen as contributing to the system as a whole.

Water entitlements are fixed, but water is supplied on the basis of what is available in the system, with domestic and industrial supply being given priority over agriculture during times of water scarcity. Irrigation water for agricultural purposes is mainly obtained from surface water resources (rivers/dams), with the Berg River being an important conduit of the water supplied from the Berg River (Theewaterskloof Dam) Government Water Scheme. There is growing competition for water between the agricultural, domestic, and industrial sectors, and between municipalities deriving water from the same water system. Escalating demand and finite supply means that protection and rehabilitation of surface and ground water systems needs to be a much greater focus³¹.

³⁰ See Gazette Notice 1079 of 9 October 2020.

³¹ Page of 18. DEA&DP Strategic Plan for 2020–2025.

In addition, the municipality is facing increased demand for water due to urbanisation, economic development, intensification of land use practices and the provision of water to meet the basic needs of a growing population. Currently, most of the water in the Drakenstein Municipality is supplied locally from the Wemmershoek Dam, which is located within the municipal area. This water is purchased from the City of Cape Town Metropolitan Municipality. This supply is augmented by dams on Paarl Mountain. Drakenstein also has an allocation from the Berg River as part of the Berg River (Riviersonderend) Government Water Scheme. Gouda's water is supplied by the West Coast District Council from the Voëlvlei Dam. Saron receives all its raw water supply from a diversion on the Leeu River. Water supply in Saron is under pressure as a result of the high demand for irrigation water in the settlement.

Groundwater is not a significant resource within Drakenstein, with only a few private boreholes being present in the area, but the most recent drought has shown the importance of this resource. The DWS has issued Licenses for Table Mountain Group (TMG) exploration by CoCT. TMG Aquifer Feasibility and Pilot Project is extensive, and roughly extends from Wolseley in the North to Cape Hangklip approximately 70 Km southwards, and the Berg River System in the west to the Breede River system in the east.

TMG Water Use Licence Applications (WULAs) concerning Drakenstein:

1. CoCT Voëlvlei 6Mm³
2. Stellenbosch Muni (Banhoek) 0.56Mm³
3. CoCT Berg River 7,3Mm³
4. CoCT Wemmershoek 3Mm³

A major study is underway in relation to the exploitation of the Table Mountain Group (TMG) aquifer. The study area for this investigation extends into the Drakenstein. According to the State of Environment Report (EEU, 2005), the municipality intends to reduce its dependence on external water sources, namely the purchase from the City of Cape Town and the West Coast District Municipality. This is to be achieved through greater use of the mountain water, supplemented by Berg River Water as well as the expansion of the Antoniesvlei scheme at Wellington. The Western Cape is dominated by two water management areas (WMA), namely Breede-Gouritz and Berg-Olifants. The Breede-Gouritz catchment supplies 59% of the Cape Town Supply while the Berg-Olifants WMA supplies 41%. These catchments are also used extensively for irrigation³². The most recent addition to the Western Cape Supply System is the Berg River Dam near Franschoek.

A major project underway is the Voëlvlei Augmentation Scheme (Pump surplus water from Berg River to the Voëlvlei Dam). An Integrated Water Resources Management Action Plan has been developed that identifies short (1-5 years), medium (6-15 years) and long term (15 years and beyond) actions to guide implementation of projects/activities and future development priorities for achieving water resource management. According to the Western Cape Integrated Water Resources Management

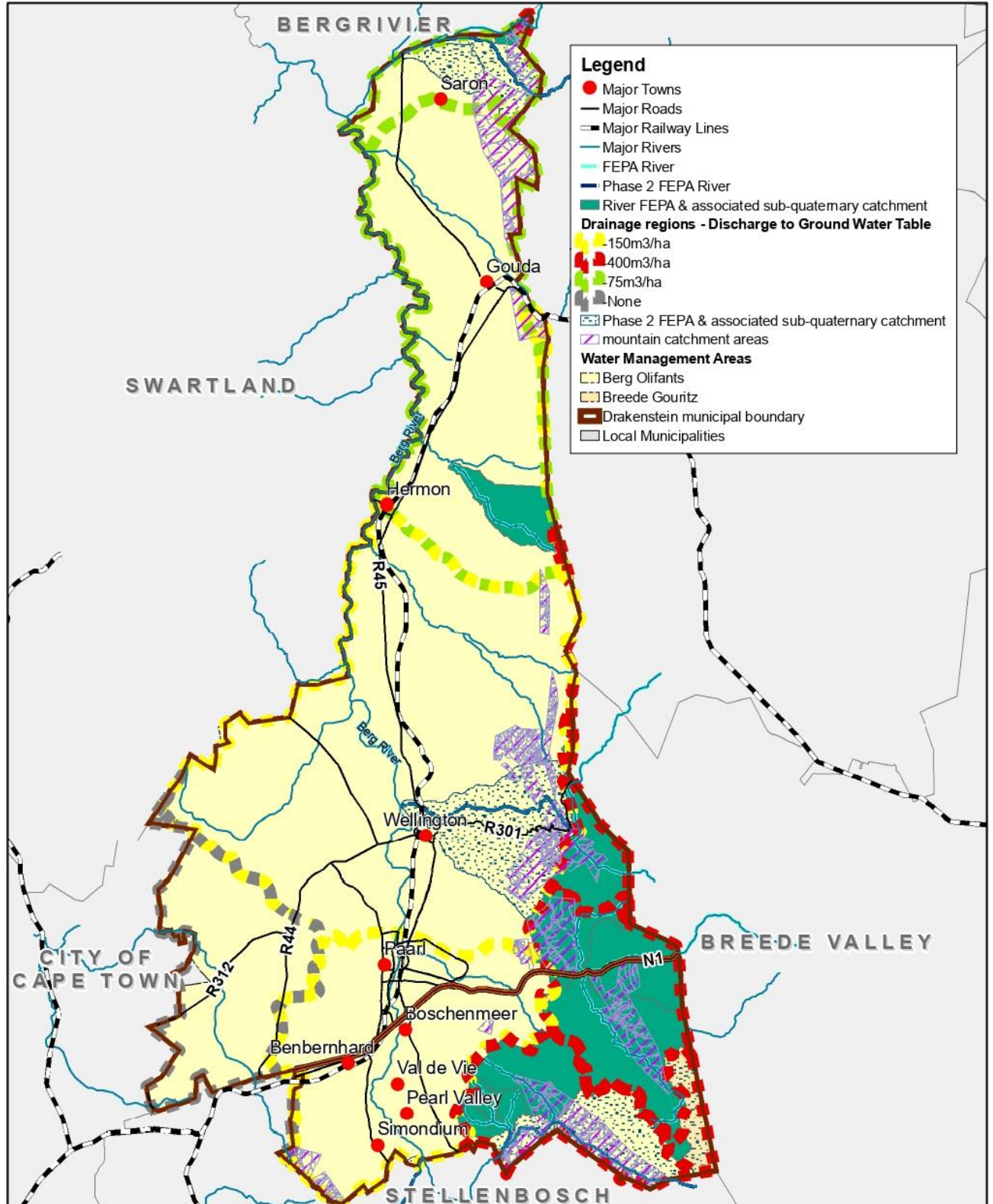
³² DEA&DP. 2018. Department of Environmental Affairs and Development Planning. Western Cape Sustainable Water Management Plan 2017 — 2022.

Action Plan: Status Quo Report ³³ sufficient water is available in the Water Management Area to meet demand until about 2018/19.

Map 8 shows hydrological information such as catchments, water management areas and drainage regions. The GIS data have been derived from the Freshwater Ecosystem Priority Areas (FEPAs) study undertaken by SANBI. Floodlines have been determined for a portion of the Berg River. This is important information for development planning. The floodline information is shown in Map 9.

³³ Western Cape Integrated Water Resources Management Action Plan (2011): Chapter 8 – The Berg River WMA.

Catchments and Water Management Areas



Legend

- Major Towns
- Major Roads
- Major Railway Lines
- Major Rivers
- FEPA River
- Phase 2 FEPA River
- River FEPA & associated sub-quaternary catchment

Drainage regions - Discharge to Ground Water Table

- 150m³/ha
- 400m³/ha
- 75m³/ha
- None

■ Phase 2 FEPA & associated sub-quaternary catchment

■ mountain catchment areas

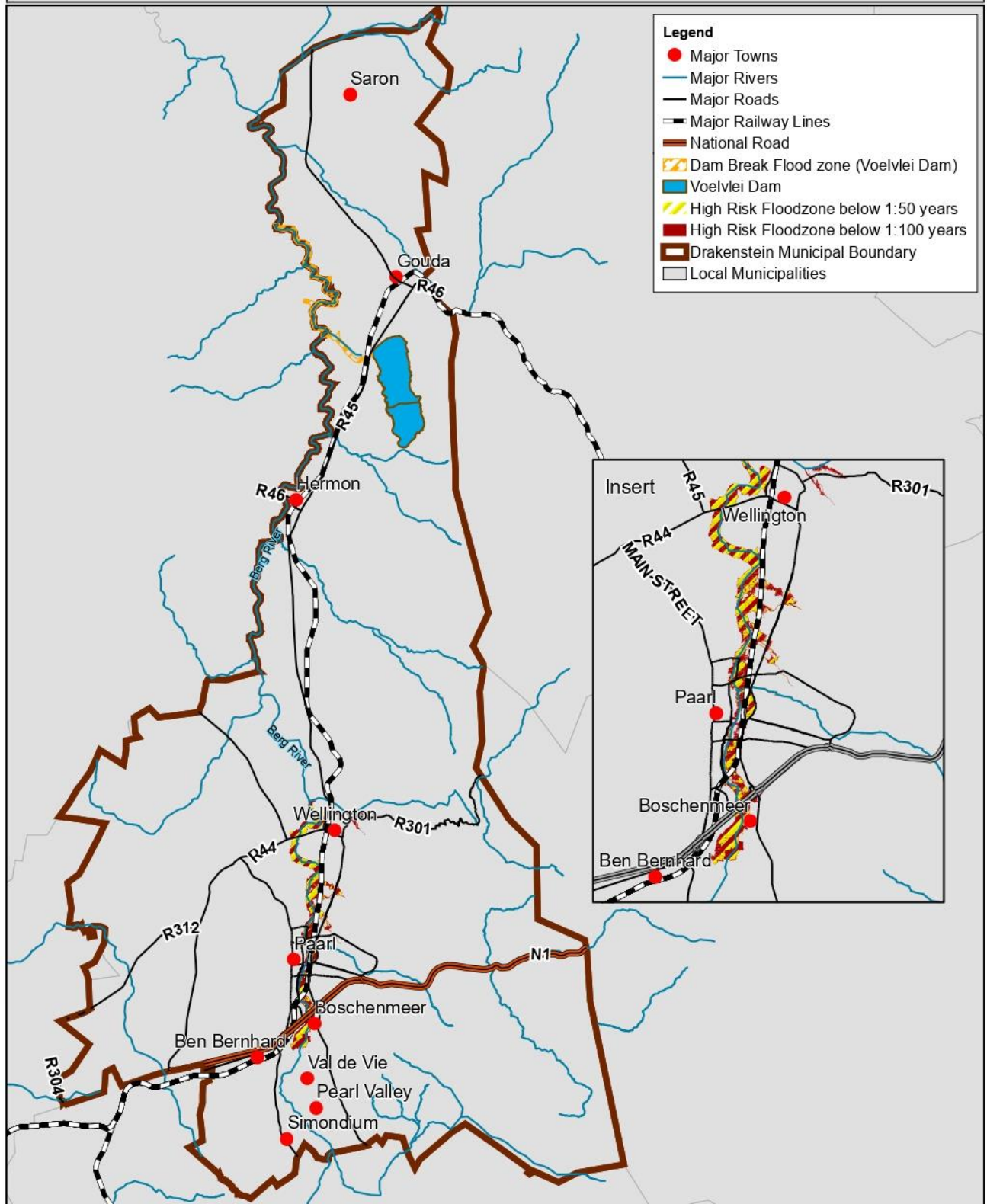
Water Management Areas

- Berg Olifants
- Breede Gouritz
- Drakenstein municipal boundary
- Local Municipalities

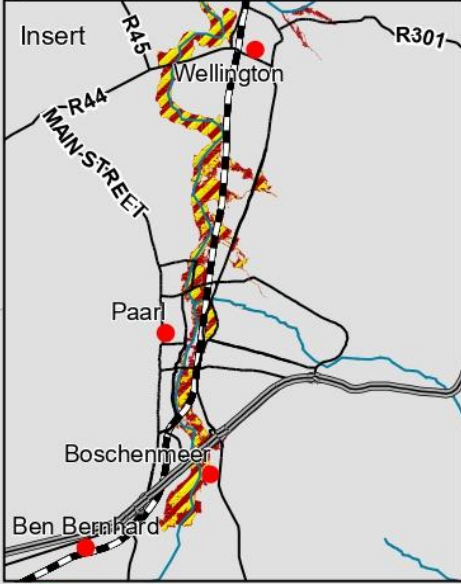
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| | <p>Created by: DEA & DP (Spatial Information Management)</p> <p>Scale: 0 2 4 8 12 Kilometers</p> | <p>Drakenstein Municipality</p> | <p>Date : 08 Dec 2021</p> <p>Scale : 1:400 000</p> | <p>DISCLAIMER Liability disclaimed. Use at own risk.</p> <p>Western Cape Government Environmental Affairs & Development Planning</p> |
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MAP 8: Catchments and Water Management Areas

Flood Zones



- Legend**
- Major Towns
 - Major Rivers
 - Major Roads
 - Major Railway Lines
 - National Road
 - ▨ Dam Break Flood zone (Voelvlei Dam)
 - Voelvlei Dam
 - ▨ High Risk Floodzone below 1:50 years
 - High Risk Floodzone below 1:100 years
 - ▭ Drakenstein Municipal Boundary
 - Local Municipalities



| | | | | |
|--|--|--|---|---|
| | <p>Created by: DEA&DP (Spatial Information Management)</p> <p>Scale: 0 2 4 8 12 Kilometers</p> | <p>Drakenstein Municipality</p> | <p>Date: 19 Nov 2021 Scale: 1:400 000</p> | <p>DISCLAIMER liability disclaimed. Use at own risk.</p> <p>Western Cape Government Development, Infrastructure & Development Planning</p> |
|--|--|--|---|---|

MAP 9: Flood zones

2.3.2 Water quality in river systems

The only part of the Berg River system that is in a near-pristine state is the upper catchment of the Vier-en Twintig River. Tributaries of the Berg River in the southern portion of the Drakenstein municipal area are ecologically degraded as a result of alien vegetation infestation and agricultural activities (associated with river modification, water abstraction and runoff of pollutants). Where the Berg River and the lower reaches of its tributaries pass through urban areas, water quality and habitat integrity are reduced mainly as a result of urban development. In the northern part of the municipal area, north of Hermon, flow patterns in the Klein Berg and Vier-en Twintig Rivers have been altered by diversion weirs. Throughout this area alien fish (e.g. bass) are widespread and have led to the disappearance of indigenous fish (e.g. Berg River Redfin)³⁴.

Water quality in Drakenstein is characterised as follows:

- A substantial increase in phosphorus and nitrogen nutrients in the Berg River between Franschoek and Paarl, reflecting inputs from the Franschoek WWTW (outside of the Drakenstein study area), as well as runoff from agricultural areas and golf estates. A significant decrease in water quality occurs between Paarl and Hermon due to a substantial increase in nutrients and contamination from runoff from poorly serviced urban areas in Paarl and Wellington.
- An increase in levels of salts in the river over the past 50 years, suggesting the influence of increases in saline return flows from irrigation along the Berg River, coupled with abstraction of water from the main channel and its less saline tributaries.
- The contribution of toxic pollutants from sources such as crop sprays, cattle dips and industrial effluent is currently unknown.

These areas include:

- Mbekweni,
- Oliver Tambo and Newton,
- Fairyland,
- New Orleans,
- Klein Nederburg,
- Klein Drakenstein and
- Zakwaziwana.

Water quality in the Berg River is a significant concern, to the extent that it has impacted on the export market for agricultural goods, as it is an important source of irrigation water. Crops that are irrigated with water that is of poor quality cannot be imported into the European Union (Europegap standards). The DWS has formulated an action plan together with industry and the municipality to address this issue. DWA undertakes regular water quality monitoring but these data have not been systematically analysed or assessed to determine trends, as yet. This monitoring does not include

³⁴ Ninham Shand and the Fresh Water Consulting Group (2009): Drakenstein River Environmental Management Plan

constituents such as those that would originate from the use of agri-chemicals (e.g., fertilisers, pesticides) or industrial effluent. The focus is on physical properties and bacteriological constituents. Treated sewage is also discharged into the Berg River from Paarl and Wellington as well as from some individual treatment plants such as the Correctional Services centres. The EIIF sets out to improve water quality and quantity within rivers of the Western Cape and provides a good entry point for potential investors whose objective is to increase and improve water availability for this region.

The EIIF is an alien invasive species strategy and ecological infrastructure investment framework aiming to proactively protect priority water resources using existing legal mechanisms in water, land use, agriculture and biodiversity legislation and planning processes. The strategy and framework will address threats to water resources from unsustainable use (over abstraction), transformation (loss of watershed priority areas through inappropriately sited and illegal agriculture) and urban development and infrastructure and land degradation as well as invasive alien species. The strategy will allow alien invasive species to be managed in a co-ordinated manner, which will benefit all stakeholders involved in alien invasive management in the broader landscape. It will also promote the active rehabilitation of degraded wetlands, rivers, aquifer recharge and riparian areas on a prioritised basis.³⁵

2.3.3 Freshwater Ecosystem Priority Areas

The freshwater ecosystems of the Western Cape consist of watercourses and wetlands and form an important basis for the ecological infrastructure of the province, as water resources are key to the socio-economic development of the Western Cape, particularly since it is a relatively water-scarce area, and it is a major limitation on further growth³⁶. Aquatic ecosystem information is available from the National Freshwater Ecosystem Priority Area project. An atlas showing FEPAs has recently been published. The FEPA maps are supported by a Technical Report.³⁷ The FEPA information has been incorporated into the EMF GIS database. Different categories are shown on the FEPA maps, each with differing management implications:

- *River FEPA and associated sub-quaternary catchment*: River FEPAs achieve biodiversity targets for river ecosystems and threatened/near-threatened fish species and were identified in rivers that are currently in a good condition (A or B ecological category). Their FEPA status indicates that they should be retained in a good condition in order to contribute to the biodiversity goals of the country. For river FEPAs the whole sub-quaternary catchment is shown as a FEPA, although FEPA status applies to the actual river reach shown on the map within such a sub-quaternary catchment.
- *Wetland or estuary FEPA*: For wetlands, only the actual mapped wetland is shown on the map as a FEPA.
- *Wetland cluster*: Wetland clusters are groups of wetlands embedded in a relatively natural landscape. This allows for important ecological processes such as migration of frogs and insects between wetlands.

³⁵ Page of 23 Western Cape Sustainable Water Management Plan 2017 - 2022

³⁶ Page of 26 Western Cape Biodiversity Spatial Plan Handbook 2017

³⁷ Nel, J.L. et. al (2011): Technical Report for the National Freshwater Ecosystems Priority Project, Water Research Commission, WRC Report No. K5/1801

- *Phase 2 FEPA and associated sub-quaternary catchment*: Phase 2 FEPAs were identified in moderately modified (C) rivers. The condition of these Phase 2 FEPAs should not be degraded further, as they may in future be considered for rehabilitation once good condition FEPAs (in an A or B ecological category) are considered fully rehabilitated.

The eastern parts of the Drakenstein municipal area are dominated by river FEPAs (Berg River and tributaries) where wetland clusters are also located. There are a number of demarcated Phase 2 FEPAs in the vicinity of Saron and Wellington.

2.3.3.1 River systems

The Berg River is critically important as a water supply to its mouth; considered the second most important estuary in the country. As one of only a few large rivers in the Western Cape, the Berg is important in its own right. However, the form of the river has changed considerably over the last 70 years, from a wide and foothill area with numerous interconnecting channels, wetlands and stands of palmiet reeds, *Prionium serratum*, and islands, sand-bars and pools in what is now the Paarl urban area, to a single meandering channel. Split channels are now limited to the reaches immediately downstream of the Wemmershoek tributary, as well as immediately downstream of Hermon. While channelisation is extensive downstream of Wellington, a few portions of the river in the Hermon area still have secondary flood channels, which contribute to hydraulic diversity.

It is noted in the Environmental Management Plan for the Berg River³⁸ that the key characteristics of the freshwater ecosystems in Drakenstein are as follows:

- Poor water quality, in particular, nutrient enrichment and bacterial contamination in urban areas as well as increasing salinity.
- Sedimentation from erosion in the catchment, and of valley bottom wetlands leading into the Berg River. Erosion caused by intense, extreme veld fires. "Cooler" fires less damage to root systems to prevent erosion.
- Increased electrical conductivity suggesting an increase in saline return flows from irrigation and abstraction from less saline tributaries.
- Erosion of riverbeds and banks from channelisation.
- Loss of stream flow as a result of alien vegetation, in particular, *Eucalyptus* spp. lining the river upstream of Paarl and downstream of Wellington.
- Loss of endemic and threatened fish species (there are four endemic fish species in the Berg River catchment; these fish – with the possible exception of the Berg-Breed witvis that is considered extinct in the Berg River – have been largely eradicated in the mainstem of the river).

Riparian vegetation along the Berg River, of importance in safeguarding the river health, has been assessed as "Poor" throughout all the reaches of the Berg River in the Drakenstein area, with the

³⁸ River Environmental Management Plan: Drakenstein Municipality. Aurecon South Africa (Pty) Ltd 2009.

exception of the reaches between the Krom River and the Klein Berg, where remnant indigenous vegetation contributes to a marginally improved score of “Fair”. Riparian vegetation is dominated by large stands of *Eucalyptus* spp. along most of the reaches of the Berg River in the Drakenstein area.

Habitat integrity in the main stem of the Berg River in the Drakenstein area was assessed by RHP (2004)³⁹ as “Fair” in the reaches upstream of Paarl, “Poor” in the reaches within the Paarl/Wellington area and downstream as far as Zonquasdrift and “Fair” to “Poor” to the downstream boundary of the Drakenstein area and beyond. The classification of the sub-catchments in respect of specific ecological criteria has been mapped: buffers along rivers and wetlands, erosion and alien vegetation.

The aforementioned Ninham Shand / Freshwater Consulting Group study on the Berg River identified ‘red flags’, namely issues that require attention (Table 3).

TABLE 2: Red Flags relating to the rivers in the Drakenstein

| SUB-CATCHMENT CODE | CATCHMENT | MAIN RIVER | RATIONALE |
|--------------------|-----------|--------------------|---|
| Die01 | Diep | Klapmuts | Severe erosion needs to be addressed |
| Ber08 | Berg | Krom | Area potentially includes some urban wetland remnants |
| Ber08 | Berg | Krom | Important remnant habitat for indigenous fish |
| Ber08 | Berg | Krom | Area contains remnant floodplain habitat |
| Ber08 | Berg | Krom | Erosion needs addressing |
| Ber15 | Berg | Berg | Erosion nick point present |
| Ber25 | Berg | Twenty-Four Rivers | Extensive area of wetlands, albeit degraded |
| Bre01 | Breede | Molenaars | Encroachment of resort dwellings onto river edge and input of trout farm effluent |
| Bre02 | Breede | Krom/Smallblaar | Trout farm effluent into near-pristine system |
| Bre02 | Breede | Krom/Smallblaar | Trout farm effluent into near-pristine system |
| Bre03 | Breede | Elands | Trout farm effluent into near-pristine system |

Exceptions have also been identified – this refers to characteristics that warrant a particular part of a river or catchment to be maintained as is because it is currently in a relatively good ecological state (Table 4).

TABLE 3: Exceptions – areas that need to be maintained due to ecological importance and condition

³⁹ Department of Water Affairs and Forestry. 2004. Natural River Health Programme: State of the Rivers Report. Berg River.

| SUB-CATCHMENT CODE | MAIN RIVER | RATIONALE |
|--------------------|--------------------|---|
| Ber06 | Palmiet | Remnant floodplain habitat on lower reaches of Palmiet River, on urban fringe |
| Ber07 | Dal | Remnant valley bottom wetlands in open space |
| Ber07 | Dal | Remnant valley bottom wetlands in open space |
| Ber07 | Dal | Remnant valley bottom wetlands in urban area – being developed at time of report compilation |
| Ber09 | Bot/Sand | Examples of remnant valley bottom wetlands in least impacted condition |
| Ber09 | Bot/Sand | |
| Ber09 | Bot/Sand | |
| Ber09 | Bot/Sand | Remnant floodplain habitat on lower Sand River |
| Ber11 | Berg | Examples of remnant valley bottom wetlands in least impacted condition |
| Ber11 | Berg | |
| Ber11 | Berg | |
| Ber11 | Berg | |
| Ber11 | Berg | |
| Ber13 | Kompanjies | Remnant valley bottom and floodplain wetlands in otherwise highly impacted sub-catchments |
| Ber13 | Kompanjies | |
| Ber13 | Kompanjies | |
| Ber15 | Berg | Remnant valley bottom and floodplain wetlands in otherwise highly impacted sub-catchments |
| Ber15 | Berg | |
| Ber15 | Berg | |
| Ber20 | Vöelvlei | Good examples of relatively unimpacted unchannelled valley bottom wetlands |
| Ber20 | Vöelvlei | |
| Ber20 | Vöelvlei | |
| Ber21 | Berg | Good examples of relatively unimpacted unchannelled valley bottom wetlands |
| Ber21 | Berg | |
| Ber21 | Berg | |
| Ber22 | Klein Berg | Highly impacted urban area of Saron, where water quality and other impacts rated as more impacted than generic assessment |
| Ber25 | Twenty-Four Rivers | Highly impacted urban area of Saron, where water quality and other impacts rated as more impacted than generic assessment |
| Die01 | Klapmuts | Examples of remnant valley bottom wetlands in least impacted condition |
| Die01 | Klapmuts | |
| Die01 | Klapmuts | |
| Die01 | Klapmuts | |
| Die01 | Klapmuts | |
| Die01 | Klapmuts | |

| SUB-CATCHMENT CODE | MAIN RIVER | RATIONALE |
|--------------------|------------|---|
| Die01 | Klapmuts | |
| Die01 | Klapmuts | |
| Die01 | Klapmuts | |
| Die01 | Klapmuts | |
| Die03 | Klapmuts | Extensive <i>Pennisetum macrourum</i> wetland |

2.3.3.2 Wetlands

A specialist wetland study was undertaken for the EMF by the Freshwater Consulting Group (Refer to Appendix C). All identifiable wetlands of three catchments included in the Drakenstein municipal area, namely those of the Berg, Breede and Diep Rivers, were mapped (see Map 10), drawing on available data, orthophotos, aerial photography and satellite imagery (Freshwater Consulting Group and MGIS, 2009)⁴⁰ using the revised National Wetland Classification System (SANBI 2009). Through limited ground truthing, it was clear that mapping was generally reliable, except where there were dense stands of alien invasive vegetation. Artificial wetlands (e.g., dams) were differentiated from natural wetlands

Of the 4 238 wetland polygons mapped, 1 463 were classified as artificial systems; most of them comprised dams. The greatest density of dams (both in- and off-channel) occurs in the wetter southern portion of the study area, particularly south of Paarl.

Most of the natural wetlands are 'hill slope' or 'valley bottom/floor' wetlands, with some being described as 'plain' wetlands on flat land close to the Berg River. Some of the least impacted examples of hill slope seeps, channelled and unchannelled valley bottom wetlands occur in the Diep River subcatchments.

- **Hill slope wetlands** are by far the most common. Most occur as seeps on relatively steep slopes. The largest area of these seeps is located in mountains of the Klein Drakenstein, the Limietberg, the Hawequas and the Groot Winterhoekberg. **These wetlands provide an important ecosystem service:** the diffuse subsurface flow through these wetlands gives them a high potential for nitrogen and especially nitrate removal. They also contribute to extending the period of flow in downstream systems, by slowing down the rate of surface and subsurface water movement down the slope.
- **Valley bottom wetlands** also occur, with the majority being naturally unchannelled valley features, although some have been artificially channelled. **These wetlands provide an important ecosystem service:** Shallow, diffuse flow through these wetlands means that they

⁴⁰ Report prepared for DEA&DP by E. (Liz) Day, K. Snaddon, S.G. Ractliffe and D.J. Ollis of the Freshwater Consulting Group, and Iselle Murray of MGIS (Appendix C).

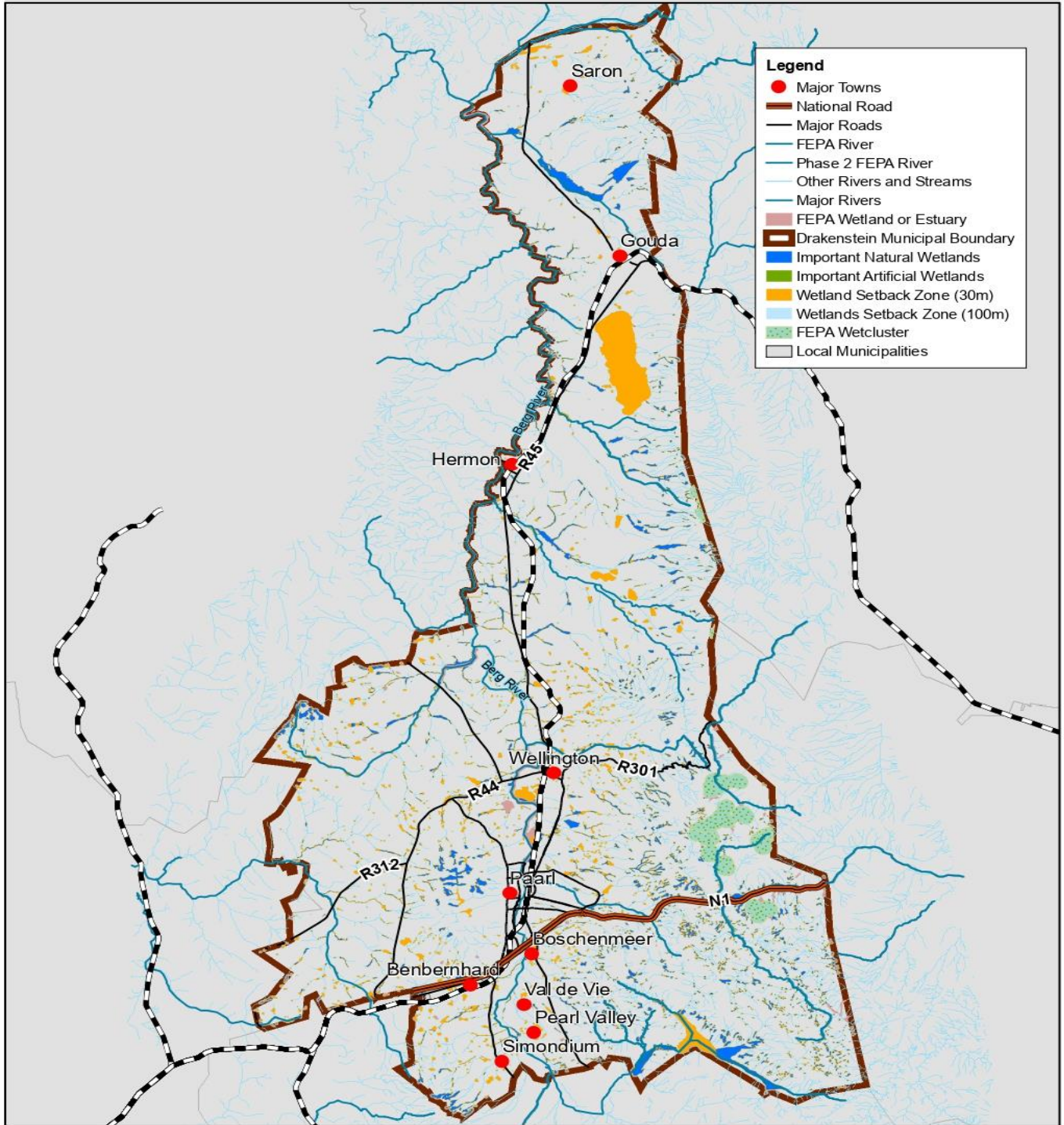
can be effective in terms of safeguarding against floods and removing phosphorus⁴¹. Also, the unchannelled valley bottom wetlands slow down water velocity during low flow and high flows and trap sediment on the banks. Subsurface seepage of water from the surrounding catchment into the valley bottom promotes removal of nitrates and other toxicants, which is further improved by close contact of water to wetland vegetation and soils.

Both the unchannelled valley bottom wetlands and hillslope seeps are highly vulnerable to headwall erosion, which results in the creation of channelled systems, and the loss of many of their beneficial wetland functions. The valley bottom wetlands are particularly sensitive to bank and bed erosion, resulting from concentration of flows; livestock trampling; burning, increased surface runoff, alien vegetation and inadequate attention to the design and placement of infrastructure such as road culverts.

Sixty percent of the area covered by natural wetlands occurs within protected areas – largely in the mountain ranges along the east of the study area. This indicates relatively high levels of protection of some of the remnant wetlands, but it also **highlights the likely extent of loss of wetlands from developed areas**; this aspect is a concern, given the fact that the large rivers in the study area, and the Berg River in particular, would under natural circumstances have been associated with extensive areas of floodplain wetlands and wetland flats (e.g., Aurecon 2009). The elimination of low-lying wetlands presents difficulty in finding extant corridors of continuous wetland in good condition that links the mountains and the main Berg River. A total of 3 654 (2 775 ha) natural wetlands occur in CBAs – highlighting the likely importance of conservation of such wetlands within a structured biodiversity conservation plan for the area.

⁴¹ Phosphorus is sometimes re-mobilised under prolonged anaerobic conditions

Rivers and wetlands



Created by:
DEA & DP (Spatial Information Management)

Scale:
0 2 4 8 12
Kilometers

Drakenstein Municipality

Date : 19 Nov 2021
Scale : 1:400 000

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MAP 10: Rivers and wetlands

2.4 Agricultural Resources

The Drakenstein area has a well-established agricultural sector. A study that was conducted by the Department of Agriculture (Western Cape) shows that a variety of fruit crops are grown in the area. Viticulture is a key sector within Drakenstein's agricultural sector, with 18% of all South Africa's wine grape cultivation occurring in Paarl. Another key product is olives, with 90% of all South Africa's olives produced in the Western Cape. Although no specific figures are available for Drakenstein Municipality, it is widely acknowledged that a significant number of olive farms occur in the greater Paarl area⁴². Map 11 shows the spatial extent of cultivation and range of crops grown.

Agriculture is characterised by the following in Drakenstein:

- There is a trend towards mixed crop farming and intensive animal farming, with many wine farmers introducing other crops such as olives and/or intensive feedlots (Refer to Map 9).
- Most feedlot composting operations are located in the western part of the municipality in the area abutting the City of Cape Town.
- Irrigated lands occur mainly in the southern part of the municipality, with the Berg River as the main water source. South of Paarl agriculture consists mainly of vineyards and fruit orchards.
- From Wellington, northwards there is a progressive shift towards dryland grain farming and stock farming.

Agriculture is a significant contributor to the Drakenstein, Cape Winelands and Western Cape economies. It is also important to the national economy, particularly through its export revenue. This is one of the reasons why the water quality of the Berg River needs to be maintained in an acceptable condition. According to the Drakenstein Local Economic Development Strategy (LEDS) some 14% of the national Gross Domestic Product (GDP) is contributed by the Western Cape, and the contribution of the agriculture sector is higher than the national average. The Cape Winelands District Municipality has the second largest economy in the Western Cape after the City of Cape Town. Agriculture forms the backbone of the district economy and contributes about 14% towards the district GDP and represents about 38% of the labour force. The agricultural sector is the largest employer in the region. Much of the manufacturing activity in the area is linked to agriculture, such as agro-processing, packaging, fertiliser and machinery (manufacture, maintenance). Whilst agriculture has shed jobs, the sector should not be underestimated in terms of its size as an employer and the important role that it plays as an economic base from which other sub-sectors have grown.

In addition, agriculture has the potential to drive technological development, particularly Fourth Industrial Revolution technologies. Agricultural output is being increased with fewer resources because of technology. Technologies such as farm-management software, precision agriculture, robotics, drones, predictive data analytics and genetics are enabling producers to e-monitor crop health, the weather and soil quality, resulting in higher yields, cost reductions and improvement of

⁴² Drakenstein LEDS, Boule and Newton, 2006.

food's nutritional value. Technology can enable new types of jobs, requiring re-skilling of the workforce. Strong partnerships are encouraged between government, academia, agri-business, and large- and small-scale farmers for technology early adoption⁴³.

Agri-processing plays an important role in the Western Cape, contributing R12 billion to the local economy, with 79 000 jobs created. The industry has been prioritised under Project Khulisa and is well-established in Drakenstein, with the city rated as having the best agri-processing value chain assets in the Western Cape Province. This offers strategic advantages. Therefore, to support the agricultural sector the municipality prioritises rural development. Rural development focuses on improving the quality of life and economic well-being of people living in rural areas who are often relatively isolated and sparsely populated. To bring about this positive change, the Drakenstein Rural Development Strategy (2017) emphasises collaboration between government and rural communities, social development at ward level, support to land reform projects, and sustainable opportunities for emerging farmers by facilitating market linkages, agri-processing training, and funding opportunities⁴⁴.

Drakenstein's extensive Hinterland constitutes Windmeul, Hermon, Gouda and Saron, as well as the rural properties. This inland region is located along the R44 and in close proximity of the N7 a strategic transport corridor of the Western Cape. The region focuses primarily on agriculture and related sector activities and therefore we identified the need to enhance the agro –processing value chain in the area. This will focus on enhancing the existing sector in the region through the development of a Business Retention and Expansion Strategy linked to the sector. The municipality will focus on both upstream and downstream linkages of this sector.

Below listed points are the agricultural sector relevant Key Performance Areas (KPA's) that were identified in the IDP 2021/2026 for Drakenstein Municipality:

- Increase awareness of sustainable agriculture to increase food security and nutritional value of agricultural products.
- Promoting off-grid agriculture infrastructure. Employ new technology such as hydroponic growing.
- Establish site for urban agriculture to promote household food security and improved nutrition.

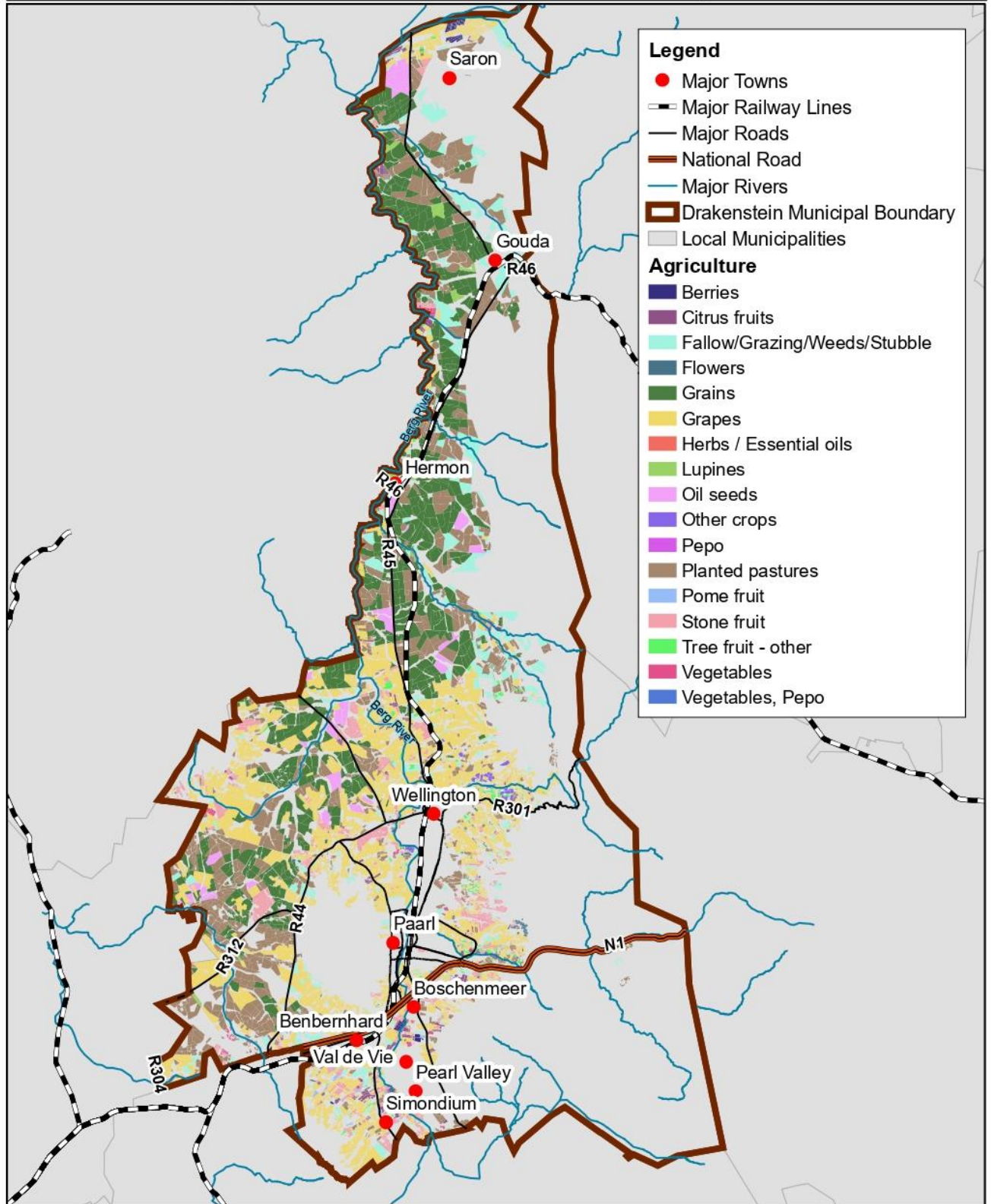
Protecting and promoting the agricultural economy is a priority for the Drakenstein Municipality. In addition, the protection of high-value agricultural land, the capability of the land should also be leveraged where possible, to support socio-economic initiatives in the agricultural industry⁴⁵.

⁴³ The Fourth Industrial Revolution, Western Cape Department of Agriculture and University of Stellenbosch, 2018

⁴⁴ Page of 14 Drakenstein Municipality: Development and investment opportunities in Drakenstein, 2020.

⁴⁵ Page of 38 Drakenstein Municipality: Spatial Development Framework 2020/2025.

Agricultural land-use and crops



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| | Scale: Kilometers | | Scale : 1:400 000 | |

MAP 11: Agricultural land use and crops

Besides the economic aspects of agriculture, the rural and farming landscapes are an important element of the cultural history of Drakenstein as well as being a key contributor to its scenic beauty (refer to section 2.5). Thus, whilst farming is a significant economic activity, it is valuable for other reasons as well including its contribution to the growing tourism sector.

From the above commentary, it is clear that the maintenance of agricultural resources in the Drakenstein area is of priority. Discussion with the Department of Agriculture indicates that loss of agricultural land to other uses is undesirable from both an economic and local food security perspective. Agricultural land that has associated water rights is regarded as being of particular value by the Department. Accordingly, agricultural land in the study area has been analysed in terms of irrigated lands and dry-land farming (Map 12).

Water is a limited resource and thus agricultural land with associated water rights is a valuable asset. Whilst agricultural potential is often used as a measure of the value or suitability of land for this purpose, in the case of Drakenstein this is not a particularly useful measure. The maintenance of current agricultural production is seen as a priority for food security, land reform and the local economy.

It is evident that almost all the productive land that is available for agriculture is already being farmed. Thus, the protection of agriculturally productive land is seen as of priority. Once land that is used for food production and other crops (e.g., wine grapes), which are important to the economy, food security and 'sense of place' in Drakenstein, has been lost to non-agricultural uses this cannot be readily reversed. A further concern in this regard is the associated change in water use away from agriculture, where irrigated lands are involved (i.e., water rights for agricultural purposes may be permanently lost to other less essential uses).

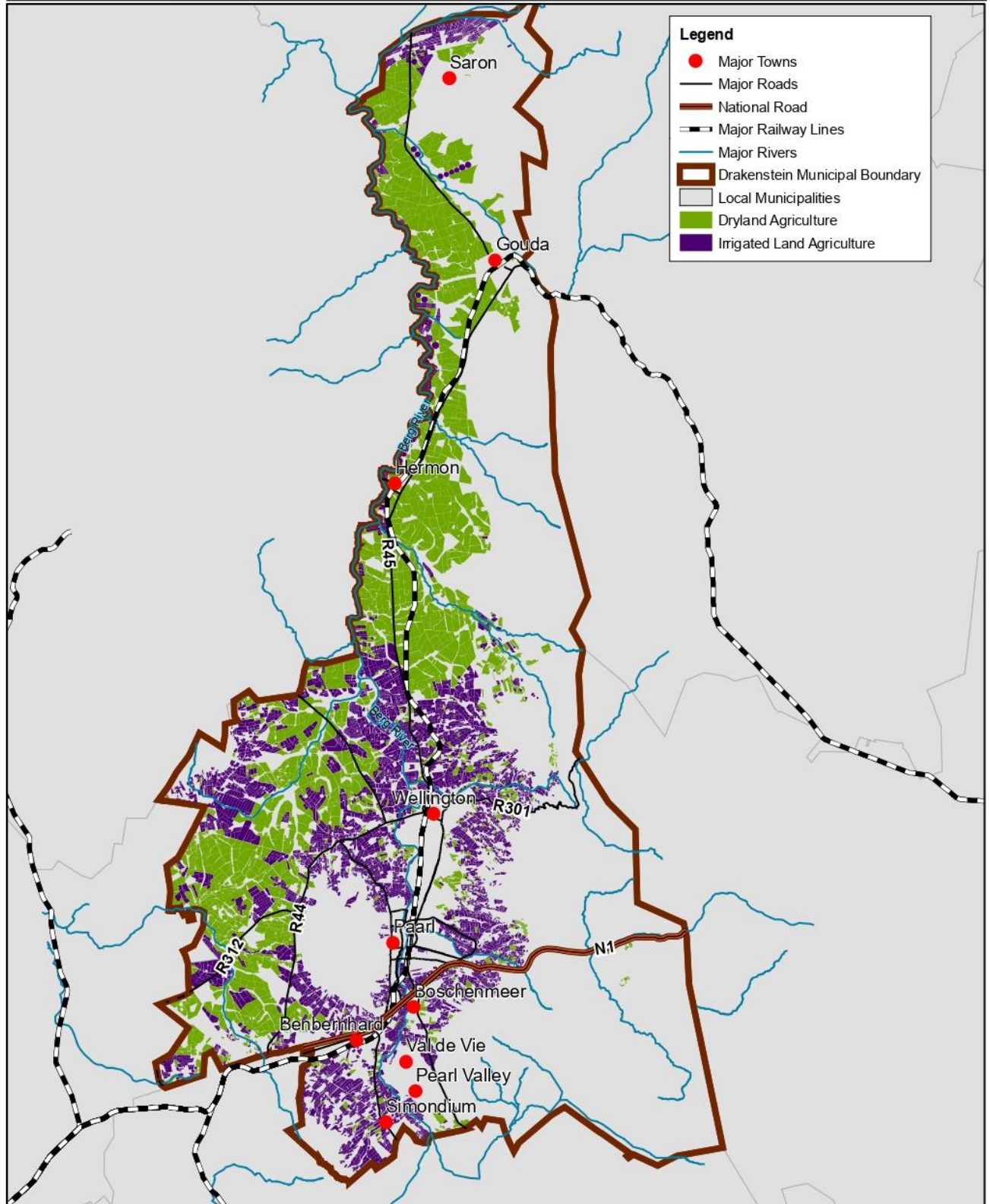
2.4.1 Irrigated Lands

Irrigated lands are considered to be of particular significance by the Department of Agriculture. The fact that these lands have water use rights is of value since this provides a level of security regarding water availability. This is particularly relevant since water is a potentially limiting factor and thus the loss of irrigated lands is highly undesirable.

2.4.2 Dry-land farming

Dryland farming is also important, but the loss thereof is less significant than that of irrigated lands.

Agricultural land- irrigated and dry land



Legend

- Major Towns
- Major Roads
- National Road
- - - Major Railway Lines
- Major Rivers
- ▭ Drakenstein Municipal Boundary
- ▭ Local Municipalities
- Dryland Agriculture
- Irrigated Land Agriculture

Created by:
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Scale:
0 2 4 8 12
Kilometers

Drakenstein Municipality

Date : 19 Nov 2021
Scale : 1:400 000

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MAP 12: Agricultural Land – Irrigated and Dryland

2.5 Cultural and Scenic Resources

The Drakenstein region was 'discovered' by Europeans while on expeditions to barter for cattle with the Khoekhoen. San hunter-gatherer resources had been impacted by the introduction of domestic livestock (sheep, goats and cattle) about 2000 years previously and San groups had mostly moved away from areas suitable for pasturing herds of sheep and cattle. In the beginning, relations between the Khoekhoen and the small Vereenigde Oostindische Company (VOC) settlement were cordial, but they deteriorated rapidly once the Khoekhoen realised that not only was the Dutch East India Company occupation permanent, but that it also excluded trade between them and the British. The loss of grazing pastures became a constant source of friction between Khoekhoen and the VOC. In 1701, the total immigrant population in the Cape Colony – free persons (inclusive of free-blacks), knechten (hired European workers), and slaves - was 2225 people. In 1700 there were 268 free burghers resident at the Cape, 164 at Stellenbosch and 130 at Drakenstein⁴⁶.

Drakenstein has a rich and diverse cultural heritage which is conserved, protected, and promoted by the municipal heritage resources management system for the benefit of its inhabitants and future generations. The municipality is one of the key cultural historical hubs of the Western Cape and contains many resources which are of scientific, environmental, architectural, artistic, social, technological, intangible, or historical significance. Many of these assets have a local, communal value and some have been formally protected as part of the national estate, while others are internationally recognised, such as the Cape Floral World Heritage Site, which forms the eastern border of the municipality⁴⁷.

In addition, according to the SoER, the cultural heritage represents an important part of the social capital of the area, which can effectively be utilised to build community identity and pride. Also, these cultural resources provide a potential tourism asset. The scenic beauty of this municipal area also contributes to its tourism potential: some of the best scenic routes and mountain passes in the Boland provide tourism links to Ceres, Tulbagh, and Wolseley (e.g., Bainskloof and Nuwekloof passes), Stellenbosch (Helshoogte) and Worcester and beyond (Du Toitskloof Pass). The roads designated as scenic routes are listed in the table in section 230 of the Drakenstein Zoning Scheme Bylaw 2018⁴⁸. Furthermore, cultural, and aesthetic resources of the Drakenstein area shown on Map 13.

A survey conducted by the *Heritage Survey Group* comprises of the following: grade 3 heritage resources, the identification of existing resources, proposed grade 3 resources and heritage overlay zones in terms of the National Heritage Resources Act, Act 25 of 1999 (i.e., heritage resources of local significance) was commissioned by the Drakenstein Municipality. The survey was approved by Heritage Western Cape in 2013 and as part of the original approval process the survey was publicly advertised. The gradings within the survey are approved by Heritage Western Cape. The proposed overlay zones identified area recognised by Heritage Western Cape as cultural landscapes. Several grade 1 and 2 resources are existing resources protected under the old National Monuments Act.

⁴⁶ A. Malan. 2018. Stellenbosch Survey Phase 3: Historical Framework (25 April 2018)

⁴⁷ Drakenstein Municipality. 2020. Development and investment opportunities in Drakenstein.

⁴⁸ Drakenstein Municipality. 2018. Drakenstein Zoning Scheme Bylaw 2018.

There has been two additional grade two resources post 2015, Elandsfontein farm and the historical mission core of Saron. The proposed grade 1 or 2 resources identified in the survey have not been formally protected by HWC. There is a formally protected heritage area at Nederberg Farm, which was not noted within the approved survey.

The following themes which characterize the Drakenstein study area, and which need to be taken into consideration in the assessment of heritage significance:

- Pre-colonial history and Archaeology,
- Early contact history,
- Early colonial settlement,
- Slavery and farm labour,
- Cultivation and agricultural production,
- Food and wine processing,
- Use of water,
- Language,
- Education,
- Religion,
- Ritual and tradition,
- Recreation and tourism,
- Scenic beauty,
- Routes and transport,
- Displacement,
- Struggle and contestation,
- Regional landscape patterns,
- Regional architecture and settlement structure,
- Military defense & surveillance,
- Manufacturing and trade,
- Civil functions and administration,

Five broad historical periods that informed the evolution of the cultural landscape of the Drakenstein Municipality have been identified:

- The Pre-colonial period,
- The 17th Century,
- The 18th Century,
- The 19th Century, and
- The 20th Century.

The approved Drakenstein Heritage Survey largely avoided the precolonial cultural landscape, and an overlay zone was never included because of insufficient evidence. The areas identified speak largely to the colonial heritage of the region, in addition to the register of heritage resources. The informants

are far broader than just the heritage areas identified. They have since been updated and mapped in detail and the results of this exercise are summarised below.

1. **Paarl:** An urban cultural landscape of outstanding heritage significance in terms of the following:
 - An urban landscape based on a linear development pattern laid out along the banks of the Berg River, spanning more than 300 years thus making it one of the oldest in the country along with Cape Town and Stellenbosch.
 - Its highly legible, intact, and historical settlement pattern uniquely combining both urban and rural components that survive side by side to this day, together with associated patterns of cultivation and planting. Also the embedded nature of the built form within this landscape.
 - The scenic quality of its historic townscape integrating built and plant forms with agricultural areas: all within a spectacular valley setting defined on one side by the iconic Paarl Mountain, and on the other by the Klein Drakenstein and other mountain ranges.
 - Its strong layering of architectural form and landscape pattern based on incremental growth over more than three centuries around the activities of the church, agriculture, and manufacturing industry.
 - Its concentration of architecturally and historically significant buildings representing periods from the 18th to the 20th century. Particular attention is drawn to oak lined Paarl Main Road, where examples include: The Strooidakkerk and Pastorie; Het Gesticht; the „Toringkerk; various surviving thatched gabled homesteads such as no’s 52, 155, 186, 189-191, 216 and others; the ornate Victorian houses in Zeederberg Square and the homestead of St Pieters Roche; 20th Century landmarks such as the Cape Revival Old Police Station, Cape Winelands District Municipality Council Offices, Paarl Municipal Offices and KWV Headquarters Building, as well as the International Style Droomers Garage and the Art Moderne Protea Cinema Building.
 - Its concentrated high diversity of exotic tree species within the Paarl Arboretum on the banks of the Berg River.
 - Its associations with early industry, with the area becoming a major industrial center during the late 19th century through milling, distilleries, tanning, wagon building and stonemasonry; and later through other industries including the export of wine in the 20th Century by the KWV.
 - Its associations with slavery through the surviving slave church on De Nieuwe Plantatie (now Grand Roche hotel), and slave cemetery on the slopes of Paarl Mountain. Also its associations with the DR Mission churches, both pre and post emancipation, such as ‘Het Gesticht’ on Main Road and the early cemeteries on the slopes of Paarl Mountain.
 - Its associations with the Group Areas Act, with the Berg River becoming the first major formal divide between white and non-white citizens of the town.
 - Its associations with the struggle for democracy, particularly from the early 1960’s, when Paarl became a leader in the national anti-pass protests.

- Its associations with education through the historic Paarl Gymnasium, Islamic madrassa, and other church schools in the area.
- Its associations with the recognition of Afrikaans as a written language with the founding of 'Die Genootskap vir Regte Afrikaners' and the publication in the first Afrikaans newspaper in the country. Also the area's historic development as focal point for Afrikaner nationalism.
- Its status as a major regional tourist destination associated mainly with its history, winelands, and scenic beauty.

The suggested grading of this area is 1 or 2 (in conjunction with Paarl Mountain).

2. **Wellington:** An urban cultural landscape of considerable heritage significance in terms of the following:

- Its urban landscape, which is based on the intersection of two linear geometries meeting at its landmark historic DR church.
- Its origins as a kerkdorp dating to 1838 and the enduring dominance of the church as a landmark feature in the town at the head of Church Street.
- Its architecturally and historically significant buildings, mainly representing periods from the late 19th and 20th centuries. These include: The Old 'Sendingsinstituut' (Huguenot College building); Cummings Hall; Bliss Hall; Ferguson Hall; House Murray; Goodnow Hall; concentrations of good residential buildings, mainly in Bain Street; and several good Cape Revival buildings in Church Street that include the post office and Standard Bank building. Other historical buildings survive in the vicinity of the station. A number 18th early 19th century homesteads are located adjacent to the riverine corridor, i.e., Versailles, Olyvenhout and Onverwacht.
- Its green edge provided by the Krom Rivier and associated viticulture to the north and the presence of historical homesteads and educational facilities along this edge.
- The encircling mountains and surrounding agricultural landscapes in particular those of Bovlei, Blouvillei and Groenberg.
- Its associations with educational institutions particularly the Huguenot University College founded by Rev Andrew Murraray; and related teacher training facilities from the early decades of the twentieth century.
- Its associations with early industry through dried fruit, tanning, leather goods, milling, winemaking and later through piano building. In its time, the piano factory was the only one of its type in the country.
- Its associations with the agricultural service industry, particularly after the arrival of the railway, Wellington being the terminal of the first railway in the Cape Colony.

- Its associations with international figures and local residents such as Beyers Naude and Breyten Breytenbach who played prominent role in the anti-apartheid movement during the latter half of the 20th century.
- Its association with the emergence of the Afrikaans Language Movement.

The suggested grading of this area is Grade 3.

3. **Saron:** has considerable heritage significance in terms of the following:

- Its social historical significance related to the establishment of the Rhenish Missionary settlement in 1846 and its associations with the history of slavery. Also, in terms of the enduring role of the historical church core as the social focus of the village.
- Its aesthetic qualities in terms its relationship with its setting within a flat open agricultural landscape and dramatic mountain backdrop.
- The legibility of its settlement structure, form, and morphology: a distinct geometric order in the form of a grid pattern with Church Street as the main axis and the religious/civic node at the head of this axis; the streets and water furrows laid out in response to topography; the alignment of dwellings along the street edge with garden allotments behind; the presence of green hollow street blocks; and trees lining the street edges contributing to a green framework.
- The high aesthetic value of the church core in terms of its open, public nature and the qualitative nature of a series of smaller, defined and more intimate spaces, namely the cemetery, the walled garden to the pastorie and tree-lined avenues. Also, in terms of the koppie to the south of the church core which together with the stature of the church are landmark features within a flat open landscape.
- The architectural value of the buildings situated within historical church core. They also form a coherent group together with the cemetery and tree-lined avenue. While the buildings have lost some of their original joinery and features, the buildings remain relatively intact. Very few of the original domestic dwellings still remain.
- The mill building which represents a significant aspect of Saron's agricultural and industrial history. While no longer in use, some of the machinery still remains.
- Its lei water system which has considerable social, technological and aesthetic significance: the fundamental role of the lei water system as a means of subsistence (food production) since its inception; its integral role in the social life of the village (rituals and ceremonies) and fostering community governance (management, maintenance, equality and self-reliance); its contribution to the character of the village and the interdependent nature of its natural and cultural heritage (religion, agriculture and water); and demonstrating a technical achievement relating to the channelling and distributing water.

The suggested grading: Church Core (Grade 2); Historical Settlement (Grade 3).

4. **Hermon:** A cultural landscape of considerable heritage significance in terms of the following:

- Its historic role as a landscape of missionary settlement/religion after emancipation, with particular reference to its role as an outstation of the Dutch Reformed Mission Church in Wellington.
- The distinctive, legible, and substantially intact mission settlement pattern of Rondeheuvel Village, even though not having reached full maturity as such.
- The legible, intact surviving townscape pattern of Hermon Village as a rural settlement established around a railway station rather than a church; and as important service centre serving the surrounding agricultural industry.
- Its historical layering of built form and development pattern established on early 19th century quitrent underpinnings (Hermon is still not registered as a township), and a diversity of historical uses. These include its role as 19th Century mission settlement with school (but no church); late 19th Century railroad node with hospitality facilities; and as agricultural centre serving the surrounding region.

The suggested grading of this area is Grade 3.

5. **Gouda:** Generally, of low to no heritage Significance. Possibly of some minor interest relating to the expansion of the railway in order to service the rural agricultural hinterland during the early 20th century

The suggested grading of this area: None.

6. **Bovlei:** A cultural landscape of potential national heritage significance in terms of the following:

- An enduring, productive agricultural landscape located outside the metropolitan area spanning more than 300 years.
- Its role in the history of winemaking spanning more than 300 years. On a national and provincial level, the Bovlei is regarded as worthy of inclusion as part of the Cape Winelands Cultural Landscape, even if not as yet on the tentative list for World Heritage Site Status.
- Its role in the history of the fruit industry spanning more than 150 years with significant early experimentation having occurred in the area (e.g., at Welvanpas under Harry Pickstone, and at Vrugbaar). More recently, also as a significant center for the propagation of vine cuttings for the viticultural industry.
- Its concentration of highly significant historical homesteads, werf complexes and associated rural settings dating from the 18th century onwards. Examples include Bella Vista, Hexenberg, Lelienfontein, Onverwacht, De Groenfontein, Groenendal, Optenhorst, Vrugbaar, Groenberg, De Twyfeling, Nabyglelgen, Welvanpas and Doolhof.
- Its highly legible, intact, and enduring historical pattern of settlement in terms of historical farmstead placement along the banks of the Bovlei and higher slopes of the Groenberg, as well as their associated patterns of cultivation and planting. Also, the embedded nature of the built form within this landscape.
- Its high scenic quality including spectacular valley settings and dramatic mountain backdrops, some of which remain unchanged since the late 19th Century. This applies in particular to the

scenic stretch between Welvanpas and Doolhof with its system of contained vineyard and orchard settings.

- Its strong layering of architectural form and landscape pattern dictated by agricultural use over centuries, as typified by farm werfs such as Vrugbaar, Onverwacht, De Twyfeling and Welvanpas.
- Its role in the architectural history of South Africa strongly reflecting the evolution of the Cape Dutch farm werf tradition. Also, its range of architectural forms and stylistic periods, including mid-19th century mission settlement.
- Its role as a landscape of missionary settlement/religion after emancipation, e.g., the historic mission settlement at Wagenmakersvallei.
- Its strong associational links with prominent Huguenot families such as the Retiefs whose family farm, Welvanpas, is still owned by the descendants of Piet Retief.

The suggested grading of this area: Grade 1 or 2.

7. ***Voor Groenberg:*** A cultural landscape of considerable heritage significance in terms of the following:

- Its historical farmsteads located on the lower plains and foothills of the western side of the Groenberg. Homesteads and farm werfs of high heritage significance located within this area include: Cordiesrus, Slangrivier, Jahalsvlei, and Groenvlei.
- It possesses a distinctive, legible, intact, and enduring pattern of historical farm werfs, set in vineyard and orchard landscapes, and, as in the case of the archetypal Slangrivier werf, terminating an approach axis flanked by vineyards and framed by the backdrop of the Groenberg.
- Its high scenic quality, including views looking up towards the Groenberg, and down towards the west, across open plains over a changing topography in the direction of the Paardeberg and the Swartland.
- Its strong rural sense of place close to a substantial developed urban center (Wellington).

The suggested grading of this area: Grade 1 or 2.

8. ***Blouvlei:*** A cultural landscape of considerable heritage significance in terms of the following:

- Its historical farmsteads located both within and around this shallow valley between the outskirts of Wellington and the foot of the Hawekwas Mountains. Homesteads and farm werfs of high heritage significance located within this area include Oude Woning, Rhebokskloof, Nietgedacht, Welbedacht, Nartia, Welgegund and Bloublommetjieskloof.
- Its distinctive, legible, intact, and enduring pattern of historical farm werfs on the residential edge of Wellington, set in vineyard and orchard landscapes, mostly within the shallow valley of the Blouvlei, and framed by the backdrop of the Hawekwas Mountain foothills.
- Its high scenic quality, including views looking down into the shallow Blouvlei River valley from most parts of the Blouvlei 'horseshoe' Road'.

- The accessibility of this scenic area, which is immediately adjacent to the eastern urban edge of Wellington.
- Its combination of elements representative of the Cape Winelands Landscape, including farm werfs, vineyards, orchards, farm dams and mountain backdrops on the very edge of Wellington.
- Its historical associations with the development of olive farming in South Africa (at Rhebokskloof) and the development of the citrus industry. (The parent grapefruit tree in the country is located on Nartia).

The suggested grading of this area: Grade 3.

9. ***Agter Groenberg:*** A cultural landscape of considerable heritage significance in terms of the following:

- Its number of historical farmsteads located in the plains to the north of the Groenberg, some of which are very early. Homesteads and farm werfs of high heritage significance located within this area include Rooshoek, Boplaas, and Kruishof. with its historic spring located on an early route into the interior.
- Its distinctive, legible, intact, and enduring pattern of historical farm werfs set in vineyard and orchard landscapes framed by the dramatic mountain backdrops of the Groenberg and Limietberge.
- Its dramatic sense of rural solitude with its extended, largely undeveloped open plains defined by the dramatic sheer linear face of the Limietberge, and the dramatic contrast between this sense of place and that of the well-established urban center of Wellington a relatively short distance away.
- Its combination of elements representative of the Cape Winelands Landscape, including farm werfs, vineyards, and dramatic mountain backdrops within a transition zone between the Cape Winelands and the more open and undulating wheat field landscapes of the Swartland.
- Its historical associations with the development of Afrikaans through CP Hoogenhout, who taught at a (still surviving) rural school located in this area.

The suggested grading of this area: Grade 3.

10. ***Daljosaphat:*** A landscape of high heritage significance in terms of the following:

- A high concentration of historical farm werfs of Grade 1 and Grade 2 status including Non Pareil (granted 1694), Roggeland (granted 1691, the original Dal Josofat), Schoongezicht (granted 1694), Kleinbosch (granted 1692) and Valencia (1818). The SAHRA owned properties including Roggeland and Non-Pareil are a declared National Heritage Site.
- Its strong associational value in terms of the relationship with the early Huguenot settlers in the valley.

- Its strong association, Kleinbosch, with the origins of the Afrikaans Language Movement, the “Genootskap van Regte Afrikaners” (1875) and the editorship of the journal “Die Afrikaanse Patriot, (1876). The Huguenot Memorial School (1893) and an associated graveyard is located on the farm.
- The visual spatial quality of the area predominantly in terms of the vivid mountain backdrop to the east.

The suggested grading of this area: Grade 1 and 2.

11. **Klein Drakenstein:** A cultural landscape of considerable heritage significance in terms of the following:

- Its high concentration of historical farmsteads located in a broad valley setting with dramatic mountain ranges to the north and south. Homesteads and farm werfs of high heritage significance located on the lower mountain slopes include Nederburg, Languedoc, Amstelhof, Wildepaardejagt, Salem, Lustigaan, Ronwe and Dekkersvlei.
- Its high scenic value in terms of dramatic upwards views towards the Klein Drakensteinberge from the raised bridge of the N2 towards the Du Toitskloof tunnel.
- The combination of a range of elements representative of the Cape Winelands Landscape, including farm werfs, vineyards and orchards with tree-lined windbreaks, and dramatic mountain settings at a major threshold or point of entry between the Cape Boland area and the flat Klein Karoo landscape to the east.
- It represents a highly distinctive, legible, intact, enduring pattern of historical farm werfs set in vineyard settings with a dramatic mountain backdrop.
- Its strong associational value in terms of the relationship with early Huguenot settlers in the valley.

The suggested grading of this area: Grade 3.

12. **Wemmershoek:** A cultural landscape of considerable heritage significance in terms of the following:

- It possesses several historical homesteads located within a distinctive and dramatic setting on the slopes between the Berg River and the Wemmershoek Mountains. A landmark example of an early nineteenth century homestead in a vineyard setting with a pristine mountain backdrop is De Hoop, first granted in 1692. The homestead dates from 1840 and is highly representative of opstalle built at the foot of mountain slopes.
- Outbuildings in such locations are typically not around an enclosed farmyard but are aligned in a row along the contour with a long distinctive werf wall holding the group together immediately in front of the complex.

- Its high scenic value in terms of views upwards toward the Klein Drakenstein slopes from the R303. Scenic values relate primarily to the relationship between the vineyard setting in the foreground and the dramatic mountain backdrop and the relatively intact, undisturbed nature of this landscape.
- It represents a highly distinctive, legible, intact enduring pattern of historical farm werfs in vineyard settings located between a river course and a mountain setting.
- Its strong associational value in terms of the relationship with prominent Huguenot families in the vicinity such as the Roux family from Nantes.

The suggested grading of this area: Grade 3.

13. ***Dwars and Berg River Corridors:*** A historical rural landscape of high heritage significance in terms of the following:

- It is highly representative of the Cape Winelands Cultural Landscape in terms of the visual dominance of a productive agricultural landscape and pattern of vineyards, dramatic mountain-valley setting, and collection of historical farm werfs.
- Its dramatic valley setting, and sense of containment created by the sheer mountain slopes of the Simonsberg and Drakenstein Mountains.
- Its key role in the history of the fruit industry with Groot Drakenstein being one of the most important export fruit growing regions in the Cape Colony. More specifically its direct association with Harry Pickstone who was a key figure in the development of the export fruit industry at the turn of the 20th century. Also, its role in the establishment of Rhodes Fruit Farms as an important experiential centre for the development of the export fruit industry and the continued presence of this major corporate institution until recently.
- Its concentration of highly conservation-worthy historical farm werfs dating from the 18th century, e.g., Boschendal, Le Rhone, Lekkerwijn, Delta, Weltevreden, Meerust, Bien Donne, Watergat, Watervliet and Riverside.
- Its role in the architectural history of South Africa strongly reflecting the evolution of the Cape farm werf tradition, the influence of the Arts and Crafts Movement and the work of one of South Africa's foremost architects, Herbert Baker.
- Its strong historical layering of its built form and agricultural related pattern of land use; farm werf, farm villages, mission settlement, agro-industry and railway network, social facilities, farm prisons and agricultural research.
- Its distinctive historical pattern of settlement which has evolved over time in response to natural landform, water courses and the movement network, and the intersection of two Valley systems. In particular, a distinctive and highly representative pattern of agricultural settlement with farm werfs strung along the Berg and Dwars Rivers and overlooking an intensively cultivated riverine terrace.

- Its relationship with the regional scenic route network, i.e., R310 and R45, and variation of views ranging from dramatic distant views towards the mountains and focused views towards landmark buildings, e.g., Boschendal.
- Its role in the history of farm labour, i.e., slavery, indentured labour, wage labour, prison labour and migrant labour, and the related shifts from a feudal to a corporate to a democratic order.
- Its direct associations with the history of slavery in terms of the settlements of Pniel and Ebenhauser Church in Simondium which were established as missionary institutions during the post emancipation period.
- The high national symbolic significance of Drakenstein Prison where Mandela was held during the last two years of his incarceration, and where negotiations took place regarding the conditions of his release and the Government of National Unity.

The suggested grading of this area: Grade 1 or 2.

Cape Winelands Cultural Landscape: In 2005 SAHRA provisionally protected the “Cape Winelands Cultural Landscape” including Idas Valley and Groot Drakenstein. This provisional protection lapsed in 2007. In 2007 SAHRA notified relevant landowners of its intent to proceed with the declaration of this area as a National Heritage Site. This process has not yet been concluded. A large portion of the area identified in this heritage survey study as the Berg River and Dwars River Corridors falls within this Grade 1 Cultural Landscape.

14. ***Simonsberg Slopes:*** A cultural landscape of high heritage significance in terms of the following:

- It is highly representative of the Cape Winelands Cultural Landscape in terms of a dramatic mountain-valley setting, the visual dominance of a productive agricultural landscape and related pattern of vineyards, and collection of historical farm werfs.
- The high iconic value of the Simonsberg and its associated wilderness upper slopes and broad agricultural sweep.
- Its role as a productive agricultural landscape spanning more than 300 years; particularly in terms of its roles in the history of the wine and fruit industries.
- It has a legible and intact historical pattern of settlement reflected in the Valley section, i.e., wilderness upper slopes, steeper mid slopes with limited human impact in terms of built form (e.g., forestry), lower slopes with agricultural development and where the majority of settlement has occurred, and the valley floor with its river courses and related intensive pattern of farming. The harmonious relationship between settlement and the land. The limited built footprint contributes to the visual dominance of wilderness and agricultural landscapes.

- The high architectural significance of several historical farmsteads which strongly reflect the evolution of the Cape farm werf tradition spanning the 18th, 19th and 20th centuries, e.g., Babylonstoren, Donkershoek, Simonsvlei, Plaiser de Merle, Vrede en Lust and La Motte. The dramatic valley and agricultural settings of these werfs and contribute substantially to their high degree of heritage significance.
- Its relationship with the scenic route network, i.e., the R45, R310, and R44, ranging from dramatic upward views towards the mountains, distant views across the Valley and focused views towards landmark buildings, e.g., Babylonstoren.

The suggested grading of this area: Grade 1 or 2.

Cape Winelands Cultural Landscape: In 2005 SAHRA provisionally protected the “Cape Winelands Cultural Landscape” including Idas Valley and Groot Drakenstein. This provisional protection lapsed in 2007. In 2007 SAHRA notified relevant landowners of its intent to proceed with the declaration of this area as a National Heritage Site. This process has not yet been concluded. A large portion of the area identified in this heritage survey study as the Simonsberg Slopes falls within this Grade 1 Cultural Landscape.

15. **Agter Paarl:** A cultural landscape of considerable heritage significance in terms of the following:
- Its concentration of historical farmsteads, a significant number of which are located against the southern, western, and northern slopes of Paarl Mountain. Many have spectacular outlooks into broad valley settings. Homesteads and farm werfs of high heritage significance located within this area include Zandwijk, Sandwyk (Klein Draken), Seidelberg (Den Leeuwenjacht), Landskroon, Fairview, Diamant, Rhebokskloof and St Martin.
 - Its distinctive, legible, intact, and enduring pattern of historical farm werfs set in a vineyard landscapes with dramatic mountain backdrops.
 - Its high scenic value as part of the Paarl Mountain landscape which is of at least regional, if not national significance. Also, in terms of its relationship with the scenic route network, i.e., R44, R43 and MR218, ranging from dramatic views towards Paarl Mountain, distant views across the valley and focused views towards landmark buildings.
 - The high iconic heritage value of Paarl Mountain in terms of its visual dominance, distinctive granite outcrops and historical associations as a place of recreation, refuge and reflection, and having been formally declared a “historical monument” in 1963 due to its “outstanding natural beauty” and a Nature Reserve in 1975.
 - Its combination of elements representative of the Cape Winelands Cultural Landscape, including farm werfs, vineyards and a dramatic mountain setting of great historical significance.

- The role of the northern Agterpaarl area in becoming one of the most important table grape areas in South Africa from the mid-20th century onwards.

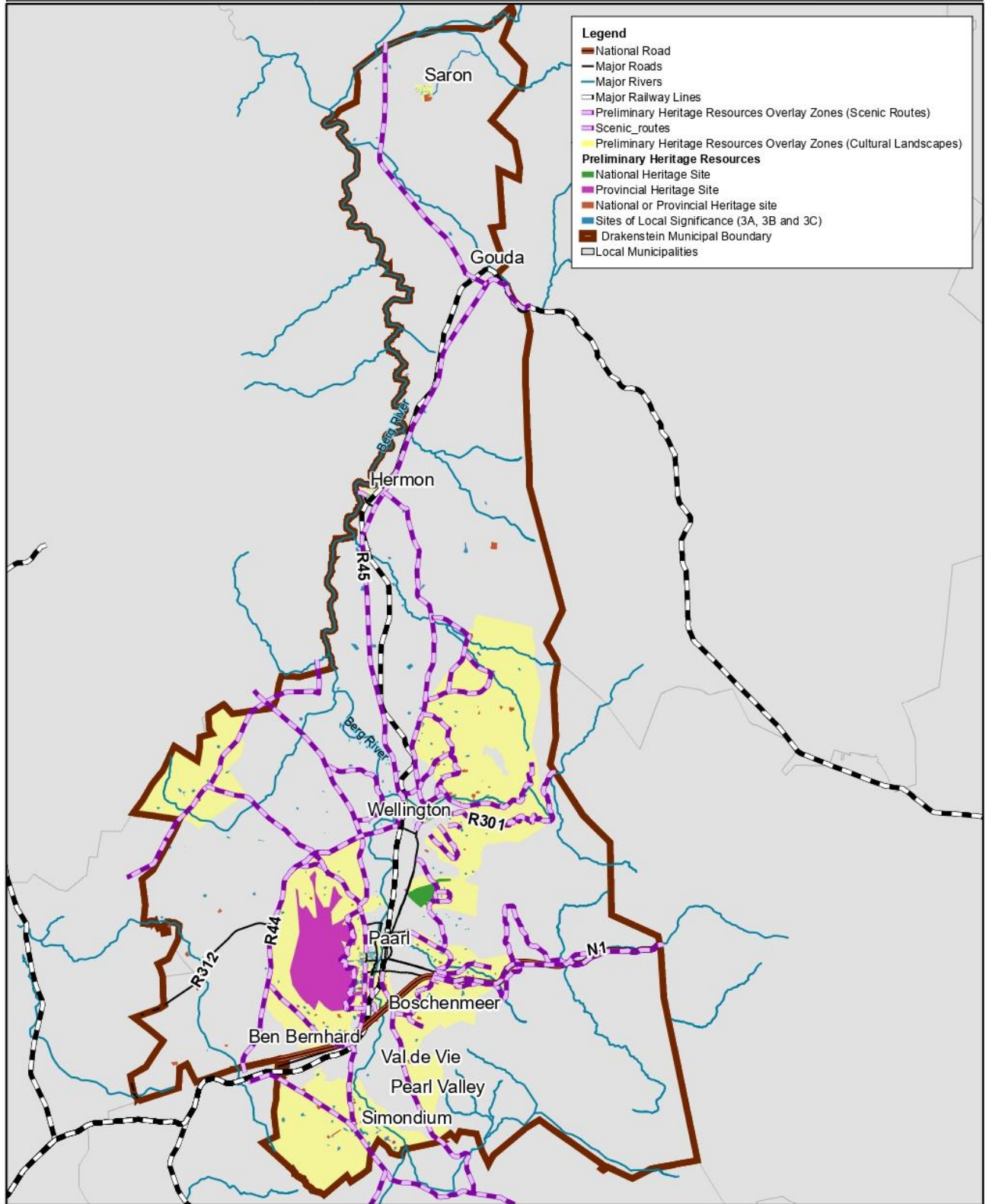
The suggested grading of this area: Grade 3.

16. ***Paardeberg:*** A cultural landscape of considerable heritage significance in terms of the following:

- Its high scenic qualities due to the open, gentle, undulating plain, flanked by the slopes of Paarl Mountain to the east and the Paardeberg to the west.
- The dispersed pattern of rural settlement on the undulating plains flanked by a more intensive pattern of settlement on the Paardeberg mountain slopes.
- The pattern of cultivation consisting of wheat fields interspersed by vineyards on the undulating plain flanked by an intensive pattern of vineyard planting on the mountain slopes. The landscape reflects a pattern of overlap and interpenetration of the Boland and Swartland cultural landscapes.
- The natural landmark qualities of the Paardeberg.
- Its high concentration of historical homesteads located on the mountain slopes such as Staart van Paardeberg, Schoone Oord and Vondeling.
- The legible, relatively intact, and enduring historical pattern of settlement in terms of the siting of homesteads, access alignments and planting patterns.

The suggested grading of this area: Grade 3.

Heritage and aesthetic resources



- Legend**
- National Road
 - Major Roads
 - Major Rivers
 - Major Railway Lines
 - Preliminary Heritage Resources Overlay Zones (Scenic Routes)
 - Scenic_routes
 - Preliminary Heritage Resources Overlay Zones (Cultural Landscapes)
- Preliminary Heritage Resources**
- National Heritage Site
 - Provincial Heritage Site
 - National or Provincial Heritage site
 - Sites of Local Significance (3A, 3B and 3C)
- Drakenstein Municipal Boundary
- Local Municipalities

Created by:
DEA&DP (Spatial Information Management)

Scale:
0 2 4 8 12
Kilometers

Drakenstein Municipality

Date : 19 Nov 2021
Scale : 1:400 000

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Western Cape Government
Development Planning & Development Planning

MAP 13: Heritage and Aesthetic resources

3. SOCIO-ECONOMIC CONDITIONS

3.1 Introduction

The Drakenstein municipal area is well known for its fruit and wine production and processing, as well as its heritage sites and tourist attractions. Paarl is the main service centre and has a rich history and several tourist attractions. Other towns in the municipal area include Wellington, Saron, Gouda, Hermon, Mbekweni and Simondium. These towns primarily serve as service centres for the local agricultural industry. The Drakenstein municipal area is very well connected with the N1 traversing the area (MERO, 2020). The population of Drakenstein is 305 281 and the number of households is 74 230. In 2018/19, Coloured households represented 55.25% of the total households in Drakenstein, followed by Black African at 23.6%, White households 20.78% and Indians/Asians being the smallest portion of households at 0.32% (IDP 2021/2026).

3.2 Poverty and employment levels

In 2017, the unemployment rate in Drakenstein (based on the official definition of unemployment) was 18.8%, which was an increase of 0.5 percentage points from 2016. Given the prevailing conditions over the past year as well as the seasonal nature of local employment in the agricultural sector as well as the narrow definition of the official definition it is estimated that the real unemployment figure is closer to 23%. The Gini coefficient is a measure of economic/income inequality. In 2017, the Gini coefficient in the municipal area rose from 0.592 in 2016 to 0.601 in 2018. The rising income inequality can be attributed to an increased working age population in low-skilled employment who earn low salaries (IDP 2021/2026).

It is concerning to note that income inequality has been increasing not only in Drakenstein, but also in the Cape Winelands and the broader Western Cape Province. This indicates that the relative satisfactory growth experienced across these regions has not equally been distributed amongst households or individuals. Income inequality has marginally increased from 0.59 to 0.60 (2016 – 2019), which represents a 0.2 per cent growth figure for the aforementioned period (IDP 2021/2026). An increase in real GDP per capita, i.e., GDP per person, is experienced only if the real economic growth rate exceeds the population growth rate. Even though real GDP per capita reflects changes in the overall well-being of the population, not everyone within an economy will earn the same amount of money as estimated by the real GDP per capita indicator. At R52 000.00 in 2018, Drakenstein's real GDP per capita is on par with the Cape Winelands District Municipality figure of R50 000.00, while marginally above that of the other municipalities in the CWDM, except for Stellenbosch. However, Drakenstein's per capita income ranks below that of the Western Cape Figure of R59 000.00.

It is estimated that Drakenstein's total labour force will in 2019 amount to 112 895 workers of which 87 547 (77.5 per cent) are in the formal sector while 25 348 (22.4 per cent) are informally employed. The National Development Plan (NDP) has set a target of reducing income inequality in South Africa from a Gini coefficient of 0.7 in 2010 to 0.6 by 2030. Income inequality has increased steadily in

Drakenstein between 2012 and 2018 (0.54 to 0.58) with the exception of 2015, when it dropped to 0.52. Furthermore, income inequality levels (Gini coefficient) were relatively on par with surrounding municipalities across the Cape Winelands District Municipality region at 0.60 for Drakenstein in 2018. With a District figure of 0.61, Drakenstein compares favourably when compared to neighbouring municipalities and the District alike across the CWDM and the Western Cape. These rather worrying disparities in income are certain to worsen across the ensuing MTREF given the expected in-migration of job seekers flowing into both Drakenstein and neighbouring Stellenbosch.

The Drakenstein municipal area created an average of 2 355 jobs per annum between 2014 and 2018. Employment creation was mainly driven by the tertiary sector during this period, particularly the wholesale and retail trade, catering, and accommodation sector (838 jobs per annum) and the finance, insurance, real estate, and business services sector (585 jobs per annum). Despite the stagnating economy, the municipal area is estimated to have realised a net increase of 117 job opportunities in 2019, which is significantly fewer than the average observed in the preceding five years. The wholesale and retail trade, catering and accommodation sector and the finance, insurance, real estate, and business services sector remained predominant sources of employment creation, albeit creating fewer jobs compared with the averages observed in the preceding five years. While the community, social and personal services sector was one of the main sources of job creation between 2014 and 2018, it is estimated that the sector shed 86 jobs in 2019.

The agriculture, forestry, and fishing sector – the second largest source of employment in the Drakenstein municipal area in 2018 – shed an estimated 151 jobs in 2019. The secondary sector is also estimated to have shed 787 jobs in 2019, mainly owing to job losses in the construction sector (548 jobs). A large proportion of employment in the Drakenstein municipal area is in the formal sector (76.6 per cent). The wholesale and retail trade, catering and accommodation sector had the largest proportion of informal employment in 2018, with informal employment accounting for 34.2 per cent of the sector's total employment. Other sectors that had a noticeable proportion of informal employment include the transport, storage, and communication sector (32.6 per cent), the agriculture, forestry, and fishing sector (32.3 per cent) and the construction sector (27.4 per cent).

Drakenstein at 14,2 per cent has the highest unemployment rate across the entire Cape Winelands District. Furthermore, this is higher than the District average (10.7 per cent), it was notably lower than the Western Cape total of 19,4 per cent. Drakenstein's modest unemployment rate is based on the narrow definition of unemployment i.e., the percentage of people that are able to work, but unable to find employment. In turn, the broad definition generally refers to people that are able to work, but not actively seeking employment.

3.3 Human Development and Indigent Households

The United Nations uses the Human Development Index (HDI) to assess the relative level of socioeconomic development in countries. Indicators that measure human development are education, housing, access to basic services and health. There has been a general increase in the HDI in Drakenstein from 0.72 in 2012 to 0.77 in 2018. The trend for the Cape Winelands District

Municipality and the Western Cape in general has been similar between 2012 and 2018. Naturally, per capita income as per definition is expected to mimic the trend of HDI and this is clearly displayed in the graphic above. In short, what this graphic illustrates is that for the most part an increase in GDP per capita across a particular region is generally accompanied by an improvement in HDI levels with a short lag. The HDI is a composite indicator reflecting education levels, health, and income. It is a measure of peoples' ability to live a long and healthy life, to communicate, participate in the community and to have sufficient means to be able to afford a decent living. The HDI is represented by a number between 0 and 1, where 1 indicates a high level of human development and 0 represents no human development (MERO, 2020).

The constraining macro-economic climate is expected to impact heavily on the various municipal areas of the Western Cape, especially in rural communities where an economic downturn will result in significant job losses across. Rising unemployment figures will subsequently result in a decrease in expendable household income which, coupled with rising inflation rates, will force many families into poverty. Municipal services will ultimately become unaffordable, resulting in these households becoming reliant on free basic services which will in turn strain the already limited resources of the municipality. The rise in indigent households within Drakenstein has been quite dramatic in recent times. This sudden increase can potentially be linked to job losses within the agricultural sector, in all sectors as a result of the lockdown due to the Covid 19 pandemic and the influx of citizens that move from outlying smaller towns to Drakenstein in search of employment opportunities. (IDP 2021/2026).

3.4 Covid 19 Impact

The impact of the Covid-19 pandemic on the economy is the loss of income suffered by households, businesses, and government due to the shutdown of the economy since 26 March 2020. It is not anticipated that the economy will make a speedy recovery and the results of the pandemic is, and will, require all businesses to re-evaluate their sustainability and business models. All sectors of the Drakenstein economy have been adversely affected by the pandemic, but sectors such as tourism have been particularly hit hard after the closure of borders and the cancellation of events. Modelling estimates undertaken after the first two months of the lockdown indicate that manufacturing, retail trade and transport will have a 50 percent loss in income, while tourism, construction and the informal sector could account for over 80 per cent of the job losses during the same period (IDP 2021/2026).

The informal sector has particularly been hit hard as most micro enterprises do not have savings and depend on daily income for their operations. The lockdown period also halted opportunities for most SMMEs to earn income, hence the establishment of various SMME relief funding schemes by the Department of Small Business Development. However, these financial aids have not been of significant immediate assistance as they are cumbersome to access and many of the possible recipients do not comply with the criteria. The Covid-19 pandemic has forced government to divert money budgeted for other priorities to the Department of Health to fight the pandemic and the Department of Small Business Development and the Department of Trade and Industry for relief

funding for businesses. While this is much appreciated, it is likely to put a further strain on government finances that have already been deteriorating (IDP 2021/2026).

The impact of Covid-19 will result in weak economic performance, high unemployment, increasing poverty, constrained government finances and therefore reprioritisation of government expenditure which will have a severe impact on the municipality's ability to deliver on its mandate. The direct impact on our households and business will further exacerbate the revenue sources of the municipality (IDP 2021/2026).

3.5 Economy

The Drakenstein municipal area's economy was valued at R22.0 billion (in current prices) in 2018, with 112 778 people being employed in the region during the year. It is estimated that the GDP stagnated in 2019 in real terms, indicating that the marginal increase of the GDP to R22.8 billion was mainly due to inflation. The following key trends have been noted, namely:

- With a contribution of 21.3 per cent to GDP in 2018, the finance, insurance, real estate, and business services sector was the leading contributor to the Drakenstein municipal area's economy.
- The wholesale and retail trade, catering and accommodation sector was the second largest driver of GDP, at 18.2 per cent. This sector is also the region's main source of employment, accounting for 22.2 per cent of total employment in 2018.
- Despite only contributing 6.5 per cent to the region's GDP, the agriculture, forestry and fishing sector was the second largest source of employment in the region, with a contribution of 16.6 per cent. This is indicative of the labour-intensive nature of this sector. Conversely, the manufacturing sector, which is the third largest contributor to GDP at 15.1 per cent, only contributed 8.3 per cent to employment, which illustrates the capital-intensive nature of this sector.

The Drakenstein and Stellenbosch municipal areas have the highest concentration of secondary and tertiary sector economic activities. While manufacturing activities were largely concentrated in the Drakenstein, Stellenbosch and Breede Valley municipal areas, and agriculture, forestry and fishing activities were mainly concentrated in the Drakenstein, Witzenberg and Breede Valley municipal areas. Across all municipal areas, the finance, insurance, real estate and business services sector and the wholesale and retail trade, catering and accommodation sector were the largest contributors to GDP. There were 396 426 people employed in the CWDM in 2018, accounting for 15.3 per cent of the Western Cape's total employment. In line with its GDP contribution, the Drakenstein municipal area provided the most employment opportunities in the CWDM in 2018, contributing 28.4 per cent to employment in the CWDM (MERO, 2020).

The Drakenstein and Stellenbosch municipal areas benefit from the proximity to the Cape Metro area in terms of having access to skilled labour. It should also be noted that some of the residents of the Drakenstein municipal area work in Cape Town and Stellenbosch. The Breede Valley municipal area,

the third largest contributor to the CWDM's GDP, was the second largest source of employment, illustrating the municipal area's relatively labour-intensive nature. On average, the CWDM created 8 925 jobs per annum between 2014 and 2018, which were mainly driven by employment opportunities in the Drakenstein municipal area (an average of 2 355 jobs per annum) and the Witzenberg municipal area (an average of 2 054 jobs per annum). The Stellenbosch municipal area was the second largest contributor to the CWDM's GDP but was the third largest source of employment in the CWDM (MERO, 2020).

3.6 Housing and infrastructure

In 2016, the vast majority of households in the municipality reside in formal dwellings (90.3%), while 9.2 per cent of households reside in informal dwellings. The percentage of households living in informal dwellings in 2016 decreased by 4.2% in the five years since census 2011. Households living in "Informal dwellings - shacks in the backyard" have decreased from 7.8% in 2011 to 4.0% in 2016, while "informal dwellings – shack not in a backyard (e.g., on a farm or an informal settlement)" has only marginally been reduced from 5.6% in 2011 to 5.2% in 2016.

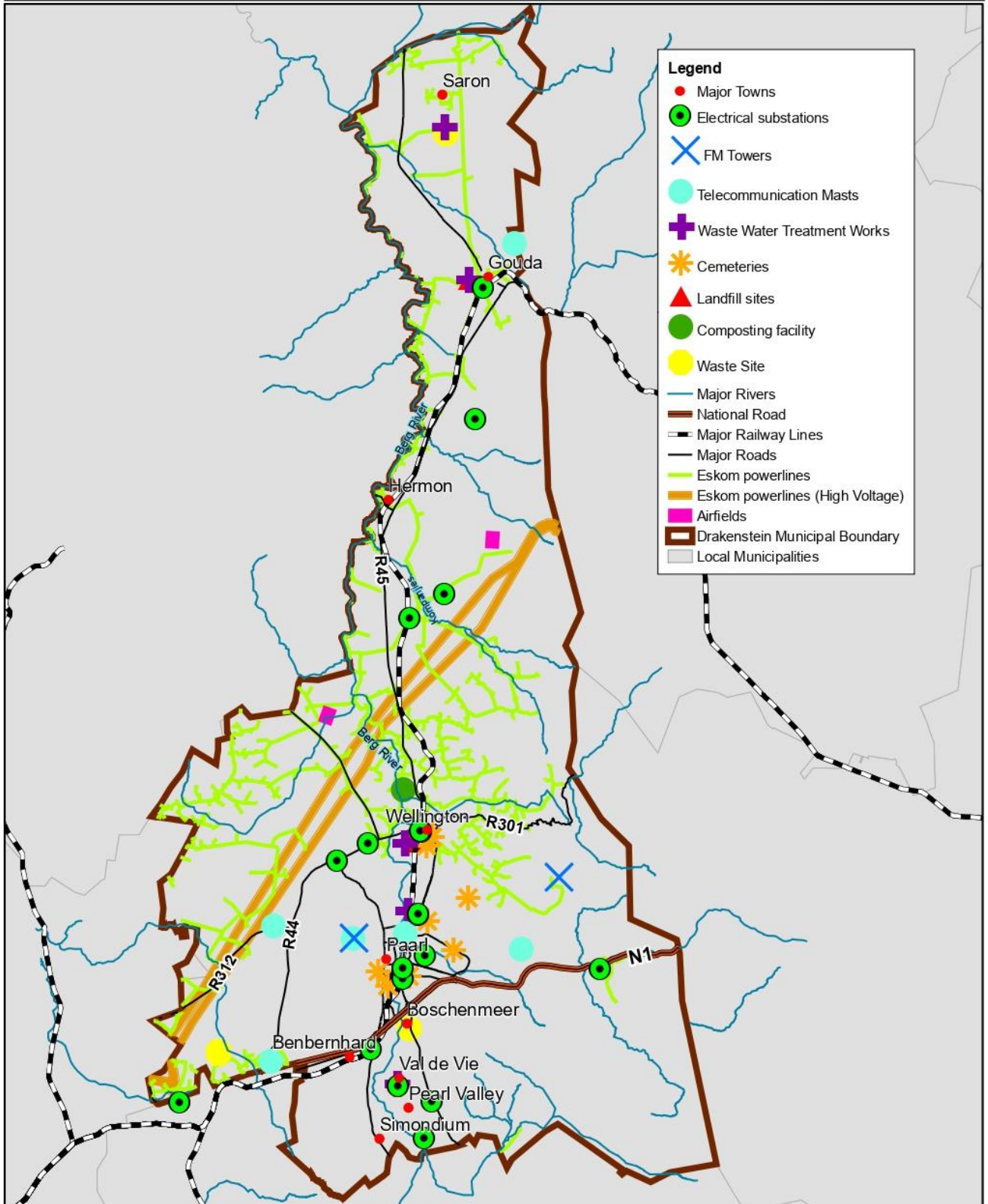
There is a generally well-developed infrastructure network in the Drakenstein region. Key infrastructure is shown on Map 14. The IDP expresses concern about the maintenance of these systems, especially as such requirements compete with the need to extend services to new development and social housing projects. Due to the lack of services, people relieve themselves on riverbanks, stormwater channels, open spaces, railway lines etc. The services currently available to these households are inadequate and, in most cases, dilapidated and damaged. This creates even more pollution as sewage, water and grey water is allowed to run freely from these facilities into the existing stormwater system.

All formal erven have access to metered water and sewer connections. Informal areas are serviced by communal toilets and water stand pipes. Sanitation services are limited to potable water supply systems and domestic wastewater and sewerage disposal systems. Access to sanitation is one of the most important basic services as it concerns the health and dignity of human beings. Municipal Services (within the urban area) are available to all schools, clinics etc. It is however the responsibility of an owner/school to apply to be connected to the applicable service. A connection fee and service deposit are payable before the service can be rendered. There are no backlogs within the urban area. Sewage tanker services are provided to Rural Schools, where the schools and clinics are not connected to the municipal gravitation system. Water Services (within the urban area) are available to all schools, clinics, factories, businesses etc. It is however the responsibility of an owner/school/businesses to apply to be connected to the applicable service. A connection fee and service consumer deposit are payable before the service can be rendered (IDP 2021-2026).

Paarl, Wellington and Mbekweni has a well-developed sophisticated internal road network providing for good vehicular access to its many urban facilities and opportunities. This road network supports a road-based public transport system dominated by mini-bus taxis providing an internal as well as

external service, connecting the towns with the rural settlements. There is also a railway line that passes the town of Saron to its west *en route* to Porterville, but there is no station or direct rail link with the town. The railway line providing for a rail-based passenger service, runs through the length of the Municipality in a north-south direction with stations located in Paarl, Huguenot, Mbekweni, Dal Josafat, Wellington, Mbekweni, Malan, Soetendal, Hermon and Gouda. It should be noted that all formal erven have access to roads (IDP 2021-2026).

Infrastructure



Legend

- Major Towns
- Electrical substations
- × FM Towers
- Telecommunication Masts
- ✚ Waste Water Treatment Works
- ★ Cemeteries
- ▲ Landfill sites
- Composting facility
- Waste Site
- Major Rivers
- National Road
- Major Railway Lines
- Major Roads
- Eskom powerlines
- Eskom powerlines (High Voltage)
- Airfields
- Drakenstein Municipal Boundary
- Local Municipalities

Created by:
DEA & DP (Spatial Information Management)

Scale:
0 2 4 8 12
Kilometers

Drakenstein Municipality

Date : 19 Nov 2021
Scale : 1:400 000

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Western Cape Government
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MAP 14: Infrastructure

3.7 Community facilities

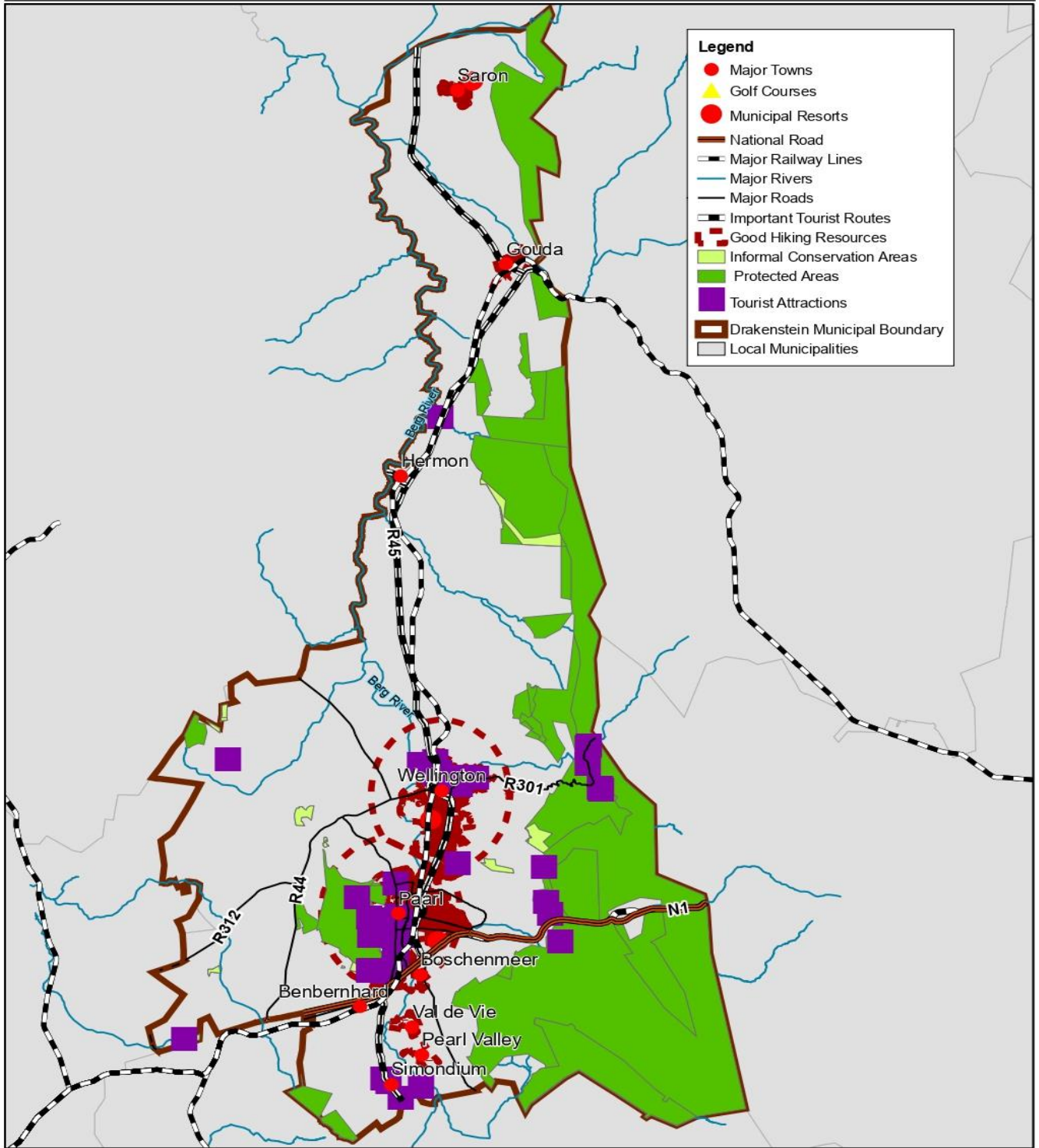
- **Health care:** In terms of the Drakenstein IDP (2021-2026) there healthcare facilities Drakenstein has 17 primary healthcare clinics (PHC), which comprises of 11 fixed and 6 mobile clinics. Although there are no community health centres in either Drakenstein or the broader Cape Winelands District, there are 3 community day centres in Drakenstein. In addition, Drakenstein has a regional hospital, as well as 18 ART treatment clinics/sites and 26 TB facilities.
- **Education:** According to the IDP (2021-2026) Drakenstein had a total of 68 public ordinary (primary and high) schools and 3 special schools. This number remains unchanged from the 2015 and 2016 figures recorded for this category. Given the tough economic climate, schools have been reporting an increase in parents being unable to pay their school fees. However, the proportion of no-fee schools dropped from 67.65 per cent in 2015 to 66.18 percent in 2017. This could in future further increase the drop-out rate. The municipality has 1 university campus located in Wellington and 3 FET colleges, which make further education accessible.
- **Cemeteries:** Based on the IDP (2021-2026) there are 13 cemeteries. All cemeteries but four (4) have reached full capacity. There is one crematorium in Drakenstein with a pending application for a second. The rating of components of this pre-determined objective relates to maintenance and challenges such as vandalism and encroachment of illegal housing structures as well as drainage.

3.8 Public tourism and recreational opportunities/facilities

The natural environment of the Drakenstein Municipality offers a number of tourism and recreational opportunities (Refer to Map 15), such as resorts along the Berg River, hiking, and picnic facilities on Paarl Mountain and in the Limietberg Reserve (Bainskloof). Formal and informal conservation areas allow for nature-based outdoor activities such as hiking, bird watching, cycling, and walking. Both Paarl and Wellington are recognised as towns that are located in areas that offer good hiking opportunities. The municipality has 24 facilities where the community can engage in various sporting codes, such as rugby, cricket, soccer, cycling, BMX, hockey, athletics, netball, and swimming. Other amenities include numerous wine farms, a lion sanctuary, a snake park, and a bird watching area at the sewage treatment works.

The impact of COVID-19 eradicated the tourism and events sector, causing more than 69% of tourism and events businesses to either lay-off or furlough staff. In order to fight for survival and in some instances, companies, wineries and SMMEs had to close down permanently. Going forward, the municipality will enhance its focus on promoting outdoor and adventure activities including those activities which make provision for families, young adults, and school learners. The direct and indirect impact of tourism on the local economy will continue to affect the overall economic growth of the area during the next two to three years. There will definitely be a much more co-ordinated and inclusive approach between the different spheres of government and industry to make the local Tourism industry more resilient and sustainable (IDP 2021-2026).

Tourism and recreational resources



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|--|--|---------------------------------|---|--|
| | Created By: DEA&DP [Spatial Information Management] | Drakenstein Municipality | Date : 19 Nov 2021 Scale : 1:400 000 | DISCLAIMER Liability disclaimed. Use at own risk. Western Cape Government Environmental Affairs & Development Planning |
| | Scale: 0 2 4 8 12 Kilometers | | | |

MAP 15: Tourism and recreational resources

PART 2 – STRATEGIC ASSESSMENT

4. STRATEGY INFORMANTS

The second element of the EMF is the Strategic Analysis. This can be seen as the “forward looking” part of the EMF. Whilst the situation analysis provides insight into where the study area stands in terms of its environmental attributes, strategic analysis looks to the desired situation for the future. In developing the strategy element of the EMF, a key consideration is that of the existing policy environment, particularly that which is relevant to land use, environment, and sustainable development. The EMF needs to be placed within and aligned to relevant national, provincial, and local policy.

Those policies which are of particular relevance to the use of landform the focus of this section. This is due to the fact that this is the most pertinent aspect to the EMF if it is to serve as a tool to guide development through ‘encouraging appropriate development in appropriate locations.’ This is how the EMF can play a role in moving towards a path of sustainable development.

4.1 National Policy

National policy is important in providing contextual information for the EMF, particularly in terms of Government’s vision from a sustainable development perspective. The National Planning Commission released the National Development Plan (NDP): Vision for 2030 in November 2011. Twelve priority areas are identified in this Plan:

- An economy that will create more jobs
- Improving infrastructure
- Transition to a low carbon economy
- An inclusive and integrated rural economy
- Reversing the spatial effects of apartheid
- Improving the quality of education, training, and innovation
- Quality health care for all
- Social protection
- Building safer communities
- Reforming the public service
- Fighting corruption
- Transforming society and uniting the economy

The National Framework for Sustainable Development – NFSD - (DEAT 2008) recognises the inter-connection between ecosystems, natural resources and sustainable development and that South Africa’s natural systems and biodiversity provide a basis for economic growth and development. Five strategic priority areas for action and intervention are identified:

- Enhancing systems for integrated planning and implementation;
- Sustaining ecosystems and using natural resources efficiently;
- Economic development via investing in sustainable infrastructure;
- Creating sustainable human settlements; and
- Responding appropriately to emerging human development, economic and environmental challenges

In the context of development priorities, the NFSD highlights the following:

- The value of ecosystems recognising that ecosystem functioning is critical to achieve sustainable development
- Improving aquatic ecosystems, specifically water availability and water quality.
- Investing in protecting and enhancing ecosystem services.
- Dematerialising the economy and improving the efficiency of production and consumption systems.
- Air quality enhancement and monitoring through investment in clean technologies.
- Energy efficiency.
- Food security and natural resource-based livelihoods.
- Economic and fiscal instruments as incentives for environmental reform in support of sustainable development.
- Implementation of international agreements.

A process to develop the sustainability strategy has been underway since 2008 and has culminated in the NFSD and the National Strategy for Sustainable Development (NSSD). In the context of South Africa’s strategy, sustainable development implies the selection and implementation of a development path which allows for the achievement of appropriate and justifiable social and economic goals (based on meeting basic needs and equity) without compromising the natural system on which human wellbeing and a healthy economy is based.⁴⁹

TABLE 4: NSSD sustainability priorities and strategic goals

| PRIORITY | STRATEGIC GOALS |
|---|---|
| Responding effectively to climate change | <ul style="list-style-type: none"> • Decrease greenhouse gas (GHG) emissions to required levels • Reduce dependency on fossil fuels and enhance security of energy supply • Improve climate resilience in communities. |
| Greening the economy | <ul style="list-style-type: none"> • Increasing the contribution of the Environmental Goods and Services Sector to employment and the GDP • Reducing the resource intensity of the economy (including energy and carbon) • Promoting cleaner technologies and investing in sustainable infrastructure • Promoting sustainable livelihoods and building local economies. |

⁴⁹ Page 34 of the NFSD

| | |
|--|---|
| Building sustainable communities | <ul style="list-style-type: none"> • Enhancing spatial planning to promote social cohesion and integration between communities as well as between communities and the natural environment • Ensuring universal access to basic and community services • Improving the standard/quality of housing and other structures to optimise resource (energy, water, building materials etc.) efficiency • Promoting self-sufficiency, food security and equitable access to natural resources that support livelihoods • Improving equity, security, and social cohesion |
| PRIORITY | STRATEGIC GOALS |
| Sustaining ecosystems and using natural resources efficiently | <ul style="list-style-type: none"> • Managing the use of all-natural resources to ensure their sustainability • Protecting and restoring scarce and degraded natural resources • Preventing the pollution of air, water, and land resources so that community and ecosystem health is not adversely affected • Avoiding the irreversible loss and degradation of biodiversity (marine, terrestrial, aquatic ecosystems) |
| Enhancing governance systems and capacity | <ul style="list-style-type: none"> • To ensure effective integration and collaboration across all functions and sectors within government • To demonstrate commitment in changing the development focus to one based on sustainable programmes • To adopt a long-term view to development planning and implementation that takes cognisance of intergenerational equity • To adhere to and exercise principles of good and ethical governance • To monitor, evaluate and report performance and progress in respect of sustainability goals. |

4.2 Sector-specific policies and strategies

Sector-specific strategies have been developed which cover various aspects of sustainability.

4.2.1 Climate change

National government's policy position⁵⁰ on climate change response is built on six pillars. These are:

- Greenhouse gas emission reductions and limits;
- Build on, strengthen and/or scale up current initiatives;
- Implementing the "Business Unusual" call for action;
- Preparing for the future;

⁵⁰ Media statement by the Minister Environmental Affairs and Tourism, 28 July 2008

- Vulnerability and Adaptation; and
- Alignment, Coordination and Cooperation.

The above priorities are reflected in the NSSD and National Climate Change Response Strategy where the key focus falls on reducing greenhouse gas emissions and dependency on fossil fuels; enhancing energy supply security; improving communities' resilience to climate change; and ensuring ecosystem resilience is not disrupted.

The Western Cape Climate Change Response Strategy was approved in 2014 and is currently under review. The draft revised strategy (to be finalised in March 2023) highlights that there is a climate crisis unfolding, and we have to take urgent action to respond to the emergency. The response must include an equitable and inclusive transition to net zero emissions by 2050, founded on investment in natural capital to reduce climate risks and increase socio-economic resilience.

For the inland agricultural areas of the Western Cape, it is important to plan for a future with less water availability, an overall higher temperature envelope, less global appetite for carbon intense products (which could be linked to long-distance transport and coal-based electricity), and increased human vulnerabilities due to socio-economic status. The economic and spatial planning must adjust accordingly, and pursue land uses and land use patterns that are compatible with a low-carbon (reduced greenhouse gas emissions) future.

4.2.2 Greening the economy

National government recognises the importance of promoting a "green economy". The Minister of Finance has acknowledged that the "cost of inaction towards sustainability will far exceed the cost of moving towards a low carbon economy" and has emphasised that the nation should be prepared to do extraordinary things to deliver the jobs and provide skills training and new businesses opportunities in "an environmentally responsible development path."⁵¹

- Increasing the contribution of the Environmental Goods and Services Sector to employment and the GDP;
- Reducing the resource intensity of the economy (including energy and carbon);
- Promoting cleaner technologies and investing in sustainable infrastructure; and
- Promoting sustainable livelihoods and building local economies.

4.2.3 Natural resources

In the NSSD natural resources (e.g., water, soil, and biodiversity) are recognised as being the basis of life, economic activity, and human wellbeing. Functioning ecosystems generate goods (natural products e.g., water, timber, flowers, food, and medicines) and services (e.g., recycling of wastes, purification of water and air, flood attenuation, recreational opportunities, and carbon

⁵¹ Minister of Finance, speaking at the United Nations Environment Programme Finance Initiative (UNEP FI) Global Roundtable, 22 October 2009

sequestration). It is recognised that the depletion or wasteful use of natural resources, and/or degradation of ecosystems, therefore poses a threat to the attainment of socio-economic objectives.

The Western Cape can be considered a globally significant biodiversity “hot spot” due to the presence of the Cape Floral Kingdom, one of only six plant kingdoms in the world. Continued degradation of ecosystems and ecosystem services in the Province is recognised as having the potential for severe effects on the provincial economy. The DEA&DP is the custodian Department in respect of biodiversity, although most of the on-the-ground management is undertaken by CapeNature. In respect of biodiversity, the DEA&DP’s stated objective is to “promote equitable and sustainable use of natural resources to contribute to economic development, by managing biodiversity, and its components, processes, habitats, ecosystems and functions and to effectively mitigate threats to sustainable management of biodiversity and natural resources.”⁵² Currently water resources in the Province are over-allocated. Accordingly, the Provincial Government of the Western Cape considers it necessary to also focus on the sustainable management of water resources due to the implications of climate change. Drier conditions are predicted particularly in the western parts of the Province.

However, with the drought conditions that continue to persist in the Western Cape (and in the country as a whole) and the ongoing impact of climate change, which predicts a drying climate for the Western Cape, there is a strong focus on the importance of protecting and restoring ecological infrastructure. This includes diversifying water supply options, developing sustainable alternative financing mechanisms for water services, and providing stronger integration of development and water supply planning. The Department's EIIF supports the catchment restoration goals, whilst furthering economic resource resilience. Protecting and restoring ecological infrastructure requires a strong transversal, transdisciplinary and "whole-of-society" approach. It also requires the various spheres of government and other sectoral role-players to put greater emphasis on cooperative governance, as required in terms of the Constitution⁵³.

4.3 Provincial policy

4.3.1. Provincial Strategic Plan (PSP) 2019 – 2024

The Provincial Strategic Plan (PSP) 2019 - 2024 constitutes both the Western Cape Province’s policy agenda and the roadmap for execution. It builds on the solid foundations of PSP 2014 - 2019, incorporates the lessons learnt along the way. The stated vision of the PSP is a sage Western Cape where everyone prospers. The following five Vision Inspired Priorities (VIPs) have been identified:

- **VIP 1: Safe and cohesive communities;**
- **VIP 2: Growth and jobs;**
- **VIP 3: Empowering people;**
- **VIP 4: Mobility and spatial transformation; and**

⁵³ Page 19 of DEA&DP Strategic Plan 2020-2025.

- **VIP 5: Innovation and Culture.**

4.3.2. OneCape 2040

The Provincial Government has also initiated OneCape 2040, a plan which complements the NDP, and which also builds on the PSOs. The vision for the Province as expressed in OneCape 2040 is for the Western Cape to be “a highly-skilled, innovation driven, resource efficient, connected, high opportunity and collaborative society”. Various transitions or changes are identified in OneCape 2040, including the need to change from unsustainable, carbon intensive resource use to sustainable, low carbon resource use.

4.3.3. Provincial Spatial Development Framework (PSDF) 2014

Another important provincial plan is the Provincial Spatial Development Framework (PSDF). The first PSDF was produced in 2009. As with other spatial plans, it is subject to regular review, with the result that a revised and updated PSDF was published in March 2014. The 2014 PSDF has the following goals:

- more inclusivity, productivity, competitiveness and opportunities in urban and rural space-economies;
- better protection of spatial assets (e.g. cultural and scenic landscapes) and strengthened resilience of natural and built environments; and
- improved effectiveness in the governance of urban and rural areas.

Accordingly, the focus in the PSDF is on:

- Sustainable use of provincial assets, such as water, biodiversity and ecosystem services, soils, minerals and scenic landscapes.
- Promoting opportunities in the space economy in both urban and rural areas.
- Developing integrated and sustainable settlements.

In terms of resource management, the 2009 PSDF committed the Province to safeguarding these assets. The following objectives were set, and these have been confirmed in the 2014 PSDF⁵⁴:

- Protect biodiversity and agricultural resources.
- Minimise the consumption of scarce environmental resources, particularly water, fuel, and land – in the latter case especially pristine and other rural land, regarded as the province’s ‘goldmine-above-the-ground’ and is a non-renewable resource.
- Conserve and strengthen the sense of place of important natural, cultural, and productive landscapes, artefacts, and buildings.

⁵⁴ Page 39 of the 2014 PSDF.

In addition to the general objectives and policies set out in the PSDF, there is specific guidance with regard to investment, policy, and location for the Drakenstein area. Paarl is identified as a town with development potential related to agricultural industry in the 2009 PSDF states that “all land put under the plough including for orchards, vineyards, forestry plantations, annual crops, pastures, and including irrigation lands shall be reserved for Intensive Agriculture and should not be converted to other purposes.” (RC4).

Besides the PSDF, there are a number of other specific policies that are aimed at giving effect to the OneCape 2040 vision. These cover infrastructure, land transport and the green economy:

1. The Western Cape Infrastructure Framework quantifies the scale and nature of the infrastructure requirements and how and where infrastructure needs to be provided.
2. The Western Cape Provincial Land and Transport Framework which sets out the requirements for effective and safe public transport systems. It also deals with links to other provinces, as well as addressing issues relating to dependence on fossil fuels within the transport sector.
3. The Western Cape Green Economy Strategic Framework aims at positioning the Western Cape as the leading green economic hub in Africa. This framework is centred around six strategic objectives:
 - To become the lowest carbon Province.
 - To increase usage of low-carbon mobility.
 - To ensure a diversified, climate-resilient agricultural sector and expanded value chain.
 - To become the emerging market leader in resilient, liveable, and smart built environment.
 - To ensure high growth of green industries and services.
 - To secure ecosystem infrastructure.

4.3.4. Ecological Infrastructure Investment Framework 2021

The purpose of the Ecological Infrastructure Investment Framework (EIIF) is to guide decision-makers from both the private and public sector in making choices around where – and how – to invest in order to promote the resilience of the Western Cape’s ecological infrastructure. This investment framework provides a point of departure for further exploration and planning by investors in the context relevant to their proposal (e.g., time, spatial and institutional context of the investor, as well as the proposed investment) (DEA&DP, 2021).

The EIIF is informed by the benefits that society derives from ecological infrastructure and the potential loss of some (or all) of these benefits if such ecological infrastructure is not restored. Within this context, the focus is on the following specific risks: risks to water security (primarily due to alien plant invasions and rangeland degradation), the risks to human life, property and livelihoods posed by uncontrolled fires and by floods (coastal and inland), and the risks to food supply and livelihoods due to rangeland degradation, particularly from over-grazing. The EIIF focuses on where – and how - maximum benefits can be derived from the restoration of ecological infrastructure, in order to alleviate these risks, which typically affect the poor the most (DEA&DP,2021).

The EIIF for the Western Cape seeks to advance, facilitate, and align investments in Ecological Infrastructure (EI) in the Western Cape Province. The aim of these investments, derived from a consultation process with a wide group of stakeholders and organisations across the province, is to achieve the EIIF’s vision for EI, which is as follows (DEA&DP, 2021):

“By 2040, people of the Western Cape live and organise themselves in a way that promotes healthy and resilient ecological infrastructure, so that it yields goods and services that support physical, psychological and spiritual well-being in the face of population pressure, rapid urbanisation and climate change.”

The EIIF sets out four strategic objectives to guide decision-makers from the public and private sector in making choices on where and how to invest in order to promote the resilience of the Western Cape’s EI. The EIIF lists four investment objectives, and this component of the Implementation and Monitoring Plan is meant to enable DEA&DP to transform the EIIF into action, to achieve these objectives in a demonstrable manner. The objectives are:

1. To **improve water quality and quantity** in support of people’s health and livelihoods in the Province, by controlling the threat of alien invasive plants specifically and improving the ecological status of rivers, wetlands, and estuaries more generally.
2. To **reduce the vulnerability** of people, property, and the environment **to the threat of uncontrolled wildfires**.
3. To sustainably support local livelihoods and food supply provided by the Province’s rangelands through **improved land management practices**, particularly relating to grazing.
4. To **reduce the exposure** of communities, infrastructure, and economic activities **to the impacts of increased flooding** within the catchment and along the coast.

In order to achieve the desired outcomes for resilient EI in the Western Cape, cooperation among different stakeholders mandated with guardianship over EI is critical (DEA&DP, 2021)

4.3.5. Western Cape Air Quality Management Plan 2016

The Air Quality Management Plan is a tool that aims to minimize the emissions of air pollutants and environmental impacts through implementing interventions and strategies that would contribute towards communities becoming resilient to climate change vulnerabilities, natural hazards, and disasters (DEA&DP, 2016).

4.3.6. Western Cape Integrated Waste Management Plan 2017

The Western Cape Integrated Waste Management Plan is a high-level strategic document, providing strategic direction to industry, the private sector, municipalities, and the broader community in terms of integrated waste management. Furthermore, the purpose of this plan is to provide a strategic

direction regarding integrated waste management over the short, medium, and long term to provincial government, local government, industry, commerce, and civil society (DEA&DP, 2017)

4.3.7. Western Cape Sustainable Water Management Plan 2018

The Sustainable Water Management Plan (SWMP) for the Western Cape Province was developed, following the recommendations made at the National Water Indaba held in Cape Town during November 2009, whereby the then National Minister of Water Affairs and Forestry, Minister Sonjica, called on the Western Cape Government to develop such a plan. The updated plan dated 2018, defines a strategic and incremental approach towards the sustainable management of water in the Western Cape. Aligning goals and objectives with the natural cycle of water, the updated Plan takes a systems approach to water security, promoting good water management practice from source to sea. This has led to the development of 16 Strategic Objectives that map the incremental steps towards improved water resilience (DEA&DP, 2018).

In addition, the updated plan has identified 12 focus areas that together will address the core goals and all the strategic objectives. The success of the Focus Areas is underpinned by effective cooperative governance, while innovation and socio-economic consideration are core Focus Areas which should run throughout the proposed activities. This plan provides the framework for improved co-operative governance to strengthen a collaborative approach to the management of the Western Cape's water resources (DEA&DP, 2018).

4.3.8. Western Cape Government's green economy framework 2013

The aim of the framework is to position the Western Cape as the lowest carbon province in South Africa and the leading green economic hub of the African continent (WCG, 2013).

4.4 Municipal policies and plans – IDP and SDF

A number of broad overarching policies in the Drakenstein IDP seek to establish an overall conservation approach for the Municipality:

- Minimal intervention in areas of natural, historic and cultural significance;
- Concern for the visual quality of the landscape and the impact of inappropriate development and development parameters thereon;
- Recognition for the important role of agriculture in the social and economic development of the community and the protection of agriculture related resources;
- Recognition of the impact of agricultural activities on the natural environment and the containment thereof;
- Protection of valuable agricultural and natural areas from urban sprawl;

- Protection of the quality and ambience of towns through appropriate development strategies; and
- Protection of the right of individuals to access nature areas, whilst at the same time limiting the negative impact thereof.

The Drakenstein Municipality IDP has identified key priority areas for intervention. These are:

1. The provision of housing, social infrastructure and basic services;
2. Local economic development and job creation;
3. Urban development should be contained within the existing boundaries of the major towns and development policy should be geared towards compaction rather than indiscriminate sprawl.

The aim of the **Drakenstein Municipality SDF** is to provide a vision for sustainable development and a framework for land use management in the Drakenstein Municipality from an environmental perspective. In order to achieve this, it is essential to ensure the following:

- That **core areas of high biodiversity value** are protected from all forms of modification and development, through the establishment of conservation policies and biodiversity management plans. In addition, **biodiversity networks** and corridors are established, delineated and mapped and that management plans are prepared for these corridors;
- That nature conservation and recreation opportunities are established in a complementary manner, allowing for the maximum access to conservation areas;
- That natural features and the attraction of the area, with special reference to the aesthetics thereof, are protected
- That the heritage resources of the Drakenstein Municipality are protected, and that the heritage resources also include the natural heritage, not only the built environment, as the context within which the built environment was established is as important as the buildings;
- That the soil and the agricultural potential of the area is protected; and
- That the water resources and wetlands of the municipality are given maximum protection in order to preserve the system as a potable resource, for irrigation and for recreation purposes. River corridors should also be defined as all land within the 1:100-year flood line or within 50m of the water's edge (whichever is greater) of a stream or river;
- Priority is given to the development of under-utilised land and vacant land in the urban areas, rather than development beyond the urban edges.
- New high density and high intensity mixed use settlements are established in areas of low environmental significance rather than permitting expansion into areas of transition around the core areas of conservation, biodiversity corridors or in areas of high intensity agriculture and relatively high agricultural potential.

- New servicing systems, e.g., water saving toilets, composting toilets and urine separating toilets, are used in all new settlements and in redevelopment areas in existing nodes, in order to reduce the average water consumption of users and to limit wastewater flows.

4.4.1 Other municipal policies and studies

4.4.1.1 Paarl Farms Study 2004

The Paarl Farms Land Use Management Policy, prepared by the Drakenstein Municipality, deals with the future use of the Paarl “town farms” to the west of the Berg River. These farms are under severe pressure for residential development and although the issue of the future use of these farms has been debated since the 1950s no final resolution of the matter has been achieved. In developing the policy an analysis of the agricultural potential of the land, and the heritage and landscape value of the properties was investigated (MCA, 2004).

The policy places a high premium on the heritage and landscape value of the remaining farms, as well as the conservation of the high potential agricultural land. As part of the formulation process, a number of development scenarios were considered, including low-density gentleman’s estate type development, and limited residential development adjoining existing residential areas. Concerns about sprawl, visual impact, and the setting of a precedent for further development, have ruled out these forms of development as inappropriate (MCA, 2004).

4.4.1.2 Densification study 2005

The Densification and Urbanisation and Open Space Strategy was commissioned to provide input to the Drakenstein SDF. It provides detailed analysis of land suitable for infill residential development, land that should be retained for use as open spaces and policies and strategies for further residential densification in existing developed areas, suitable for such development. The strategy proposes integration of urban activities, socioeconomic integration and a pattern of densification that promotes a minimum gross density of 25 dwelling units per hectare (CNdV, 2005).

4.4.1.3 Air Quality Management Plan 2011

The Air Quality Act follows a holistic approach to air quality management by addressing all sources of emissions and assessing the resulting impacts on the receiving environment and on human health. This is done through the development of air quality management plans at the various spheres of government, from national level down to local level. The main objective of these plans is to ensure that once implemented, the air quality of the area will effectively and efficiently be brought into sustainable compliance with ambient air quality standards within agreed timeframes. The Air Quality Act follows a holistic approach to air quality management by addressing all sources of emissions and assessing the resulting impacts on the receiving environment and on human health. This is done through the development of air quality management plans at the various spheres of government,

from national level down to local level. The main objective of these plans is to ensure that once implemented, the air quality of the area will effectively and efficiently be brought into sustainable compliance with ambient air quality standards within agreed timeframes. The DLM AQMP is intended as a management and performance monitoring tool for managing air quality within the municipality. The plan also aims to encourage regular engagement with relevant stakeholders to raise awareness regarding air quality issues and the monitoring and management thereof (Aurecon Group, 2011).

4.4.1.4 Drakenstein Integrated Waste Management Plan– Draft Report 2019

The development of the 3rd generation Integrated Waste Management Plan is necessary as it is an integral tool to identify current needs and act as a guide towards sustainable waste management. The primary objective of integrated waste management planning is to integrate and optimize waste management, in order to maximise efficiency and minimize the associated environmental impacts and financial costs and to improve the quality of life of all residents within the Drakenstein (JPCE, 2019).

4.4.1.5 Drakenstein Climate Change Adaptation Plan

The Drakenstein Climate Change Adaption plan aims to create a coordinated response to climate change within Drakenstein Municipality by highlighting the work that has already been done and to offer a structure through which interventions can be further strengthened and supported. It also aims to encourage collaboration between stakeholders and attempts to outline the various roles and the effective implementation of the National Climate Change Response Policy is dependent on the efforts of provincial and local governments. Local governments are at the forefront of building resilience in communities to adapt to climate change impacts (DM, no date).

4.4.1.6 Drakenstein Disaster Management Plan 2021

This plan confirms the arrangements for managing disaster risk and for preparing for and responding to disasters within the Drakenstein Municipality as required by the Disaster Management Act, 2002 (Act 57 of 2002). This plan seeks to achieve the following outcomes: Integration of Disaster Risk Management into the strategic and operational planning and project implementation of all line functions and role players within the Municipality; Resilient communities; and an integrated, fast, and efficient response to emergencies and disasters by all role- players (DM, 2021).

5. ANALYSIS OF KEY TRENDS, CONCERNS AND OPPORTUNITIES

This section provides an overview of key trends, concerns and opportunities based on the Situation Assessment. Positive trends and opportunities are also discussed.

5.1 Key trends and pressures

Scientific research and anecdotal information provided by local organisations points to a number of negative trends and pressures. These need to be considered in land use planning and development of the area, particularly if the vision is to be realised.

5.1.1 Economy

- Drakenstein Municipality's economy is not sufficiently diversified, both in terms of sub-sectors and the export basket.
- Economy is vulnerable due to external shocks such as the drought. Real annual growth for Drakenstein declined sharply in 2009 and 2015.
- Capital Investment is declining, and the pace of job creation is too slow to absorb labour with high levels of youth unemployment.
- Drakenstein requires a balanced portfolio of sectors to create a more resilient, productive, and equitable economy. Attention will need to be paid to investment promotion, rolling out ICT infrastructure, skills development, and entrepreneurship.
- The spread of the global COVID-19 pandemic and the subsequent lockdown period has severely impacted the local economy for now and in the near future. Furthermore, it puts pressure on job security, financial security, etc. Attention needs to be focused on better disaster risk management strategies, assisting local business enterprises to recover, implementing, and giving access to better and faster internet/Wi-Fi services and promoting good health practices for all.
- Drakenstein needs to be prepared to manage/combat future pandemics/epidemics in order to create a safe and healthy environment for all in the municipal area.
- Restricting development on the Paarl "town" farms may result in inappropriate pressure for development elsewhere in the area. The Paarl Farms study noted the pressure for middle to high end development, although no empirical research in this regard has been undertaken to date.
- The development of mining resources (mainly quarries) is a problem, in terms of degradation of 'sense of place', loss of agricultural land and of biodiversity. Rehabilitation of old quarries is seldom satisfactory.

5.1.2 Infrastructure

- Wastewater: The current backlog must be addressed to provide at least a minimum level of wastewater service, High Groundwater Infiltration and Wastewater Treatment Plant (WWTP) overflow during high rainfall days.
- Wastewater: A range of pump stations require upgrading.

- **Electricity:** The reticulation network needs strengthening to facilitate planned growth in existing areas and new developments on the urban edge, namely Vlakkeland and developments south of the N1, which will require the construction of new 132/66/11 KV substations. Informal and illegal electricity connections remain a challenge.
- **Stormwater:** Providing new detention dams to ensure stormwater management for housing projects and addressing aging stormwater infrastructure with renewals and replacement. Another major challenge in terms of stormwater is the lack of an integrated stormwater management plan for the Municipality as a whole.
- **Solid Waste Removal:** The Wellington Waste Disposal Facility is close to reaching its capacity as it is close to running out of airspace.
- **Transport:** The Integrated Transport Plan (ITP), compiled by Drakenstein Municipality, identified the following problem areas that must be addressed: safety, long waiting times, poor integration between modes, illegal operations, and lack of law enforcement. In recent years Drakenstein has also experienced an increase in heavy freight vehicles as Paarl expanded its industrial areas.
- **Traffic congestion** is identified as one of the major issues in Drakenstein that needs urgent attention. It is envisioned that the new integrated traffic management plan will aim to address this issue.
- **Aging bulk infrastructure.** The cost-of-service delivery increases due to unplanned maintenance on bulk infrastructure that has passed its operation life

5.1.3 Natural environment

- Ad hoc transformation of the natural landscape, without considering scenic landscape quality, cultural heritage significance, and loss of biodiversity, including threatened ecosystems and species that may take place, especially within the urban area.
- Urban encroachment into agricultural areas that offer good soil potential.
- Land degradation and increased water and soil contamination as a result of urban sprawl.
- The persistence of alien vegetation, which allows for veld fires to occur more frequently and intensely, destroying soil structure and seed banks.
- Climate change is predicted to be a major long-term threat to biodiversity, as it is likely to cause a shift in species distribution.
- Climate change is not a threat to biodiversity alone, but also holds risks for Drakenstein related to loss of ecosystem services, increased fire likelihood, flooding, drought, and heat stress.
- Over-abstraction and modification of natural watercourses is altering flow regimes, which impacts on species migration and breeding, aquatic habitats, food resources, and wetland ecosystems.

- There is a risk of urban sprawl and loss of valuable agricultural land due to development being located outside of, and at a distance from, existing towns. There is a need to manage a way of developing rural agricultural areas, so that no other development on high yielding agricultural land occurs.
- The climate in the Drakenstein municipal area will trend warmer and drier over the foreseeable future, as per recent projections of climate change⁵⁵. The central areas are likely to see a 7.4% decline in total annual precipitation and 0.64°C increase in average annual temperature by 2030 (relative to a 1981-2010 baseline) under a high emissions scenario (SSP5 8.5). This will need to be considered when planning for water-dependent activities and economic sectors that are sensitive to climatic conditions. At the same time, the Western Cape will be actively decarbonising its energy systems, resulting in increasing costs or dead-ends for activities that are tied to fossil fuel-based energy.
- There is no natural buffer along the Berg River and many of the smaller rivers as well. In the case of the Berg River, ‘hard’ development extends right up to the riverbank along most of its length – this poses a risk to these developments due to flooding, which is likely to increase with global warming. Encroachment of development into wetland and riverine areas is therefore of key concern.
- Invasive alien plants and invasive alien fish in rivers are both problematic. Currently no integrated or coordinated alien removal programme exists for the municipality.
- Some of the areas with high biodiversity have a high agricultural value (e.g., areas surrounding Paarl Mountain). These areas usually have high land prices due to this high agricultural potential. Land clearing for either agriculture or development is a threat to the biodiversity of an area.

5.2 Key opportunities and constraints

Constraints: These can be grouped as follows:

1. Limiting factors to the development of physical structures or infrastructure, or the transformation of natural areas, and
2. Factors that are unlikely to contribute to, and may detract from, sustainability.

It is important to note that the ‘constraints’ in respect of certain types of development may present opportunities for other activities that do not rely on significant structures or infrastructure, such as tourism and recreation (e.g., passive recreational opportunities require minimal infrastructure and thus may not result in significant environmental impacts provided they are correctly managed).

Factors that require consideration in respect of infrastructural or physical development;

⁵⁵ Sixth Assessment Report of the Intergovernmental Panel on Climate Change, 2021, Interactive Atlas: <https://interactive-atlas.ipcc.ch/>

- River conservation status, water quality issues
- 1:100-year floodlines
- Heritage areas and objects
- CBAs, special habitats, threatened ecosystem status, ecological corridors, etc.
- Protected areas (nature reserves - provincial, local, national heritage sites, mountain catchments, conservancies, etc.)
- Catchments, wetlands
- Steep slopes >1:4
- Valued landscapes / landscape features
- Important areas for threatened species (bird, mammal, lower vertebrate areas)
- Erosion.

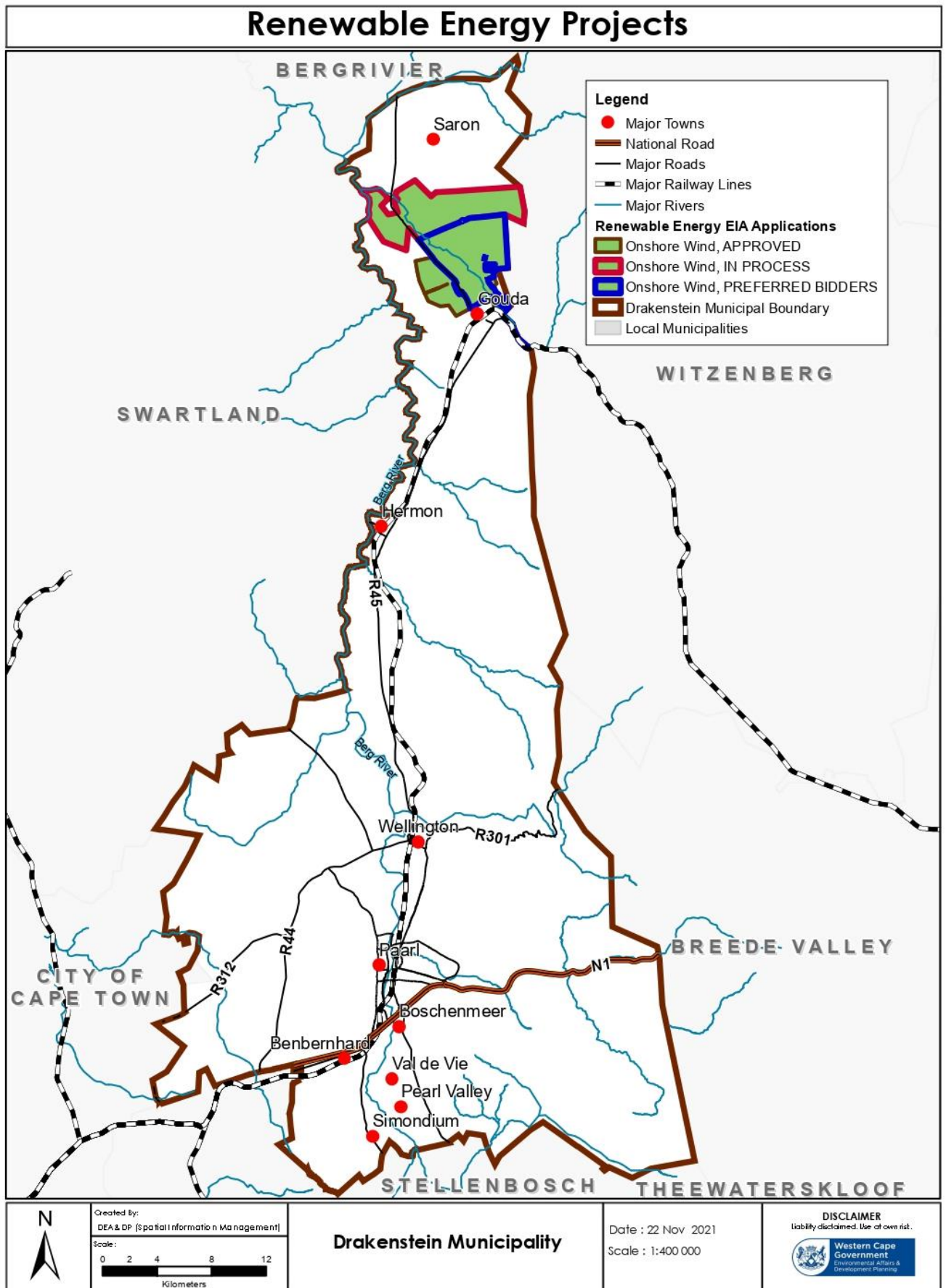
Opportunities - A combination of favourable circumstances or situations to support further development in a sustainable way:

1. An opportunity within the agricultural sector is that of responsible farming through participation in programmes such as the Biodiversity and Wine Initiative and Fair Trade. The Western Cape Government's green economy framework, 2013 identifies this as an opportunity. With the strength of the agricultural sector in Drakenstein there are growth opportunities that marry ecological and agricultural needs. This also applies to agri-industries and agri-tourism.
2. Recreation and tourism: the Drakenstein has landscape character of heritage/ cultural value, unique natural/landscape assets/features, World Heritage Site (natural), World Heritage Site nomination (Cape Winelands, cultural), the UNESCO Winelands Biosphere Reserve and events such as the Berg River Canoe Marathon, etc. According to the SDF, further investment opportunities within the tourism industry in the Drakenstein Municipality include:
 - development of theme resorts;
 - craft products and retail facilities for tourist travellers;
 - recreation, "activity" and sports-related facilities;
 - specialised farm and township tours;
 - health tourism facilities;
 - heritage tourism facilities;
 - retirement/tourism residential developments;
 - upgrade of tourism infrastructure;

- further accommodation facilities – hotels, guesthouses, backpackers, homestays, farm-based; and
 - convention and exhibition facilities.
3. Opportunities to improve delivery of ecosystem services and increase labour-intensive employment by, amongst others, clearing of alien vegetation in particular from catchments and riparian zones, restoring degraded areas and river corridors, improving management of soils, water, and indigenous habitats, and acting as stewards for natural resources. There is potential to explore schemes in the Drakenstein area to boost a ‘green economy’.
 4. Land reform and rural development are important priorities in the NDP. Provincial and local government have a supportive role to play in terms of land reform, as the constitutional mandate in this regard is vested in national government. The PSDF provides a spatial framework that is aimed at supporting national programmes related to land reform and rural development. In addition, the PSDF notes the need to channel public investment into rural development initiatives (i.e. land reform, agrarian transformation, environmental rehabilitation, enterprise development, etc.) to areas where it can offer real and sustained improvements to beneficiaries and the rural community.⁵⁶ Potential to realise such opportunities (land reform, rural enterprise development and environmental rehabilitation) exist in Drakenstein due to factors such as its agricultural potential and the fact that there is state-owned land. Established land reform projects within this area are also shown.
 5. Development of the green economy is a focus of the Western Cape Government and a strategy framework has been developed. According to the Western Cape Government’s green economy framework the province is well placed to be the most important research and servicing hub for renewable energy in South Africa and even Africa. Alternative energy projects are underway in Drakenstein as is shown on Map 16. According to the IDP energy efficiency is one of the Key Focus Areas of the municipality. The municipality has adopted a Green Building Manual. The development of an Energy Master Plan is underway. The changes to South Africa’s Electricity Regulations on New Generation Capacity legislation require municipalities to apply to the Minister of Mineral Resources and Energy to “procure or buy new generation capacity in accordance with the Integrated Resource Plan⁵⁷.

⁵⁶ Page 65 - 2014 PSDF

⁵⁷ The Minister of Mineral Resources and Energy, Mr. Gwede Mantashe (MP) has today, 16 October 2020, gazetted amendments to the Electricity Regulations on New Generation Capacity.



MAP 16: Renewable energy projects

6. EMF VISION AND STRATEGIC OBJECTIVES

The vision and strategic objectives that have been developed for the purposes of the EMF has taken account of the policy context, stakeholder inputs, the situation analysis and the analysis of opportunities, pressures, and trends. Objectives relating to sustainable development as put forward by national, provincial, and local government provide the context for the EMF's vision and objectives.

6.1 Stakeholders' values/opinions

This section will summarize the viewpoints offered by stakeholders during the public involvement period. The views and opinions of stakeholders obtained throughout the consultation process will be presented here.

[to be inserted]

6.2 EMF vision and strategic objectives

Vision

An environment to sustain livelihoods, and the health and wellbeing of people:

Strategic objectives:

- To clearly communicate the limits of acceptable change relating to the natural and cultural environment for consideration in decision-making by all authorities. The proponent/applicant is responsible for demonstrating that proposed development would not infringe on or cross those limits of acceptable change.
- To create a predictable development environment, providing an early warning system for developers of the levels of likely risk in submitting development proposals in different areas and the associated need to consider alternatives to minimise unacceptable impacts on the environment.
- To apply the mitigation hierarchy, namely first striving to avoid and then minimise and remedy negative impacts, as a requirement of the national environmental management principles (Section 2 of NEMA).

To guide land use, including the location of development in the Drakenstein Municipality in such a way that it:

- conserves high productivity agricultural soils;
- conserves important biodiversity;
- conserves systems that regulate and provide reliable supply of clean water;
- avoids, and where not possible fully to avoid, minimises pollution of land, air, surface water and groundwater;

- conserves land cover to prevent erosion;
- conserves heritage and cultural resources;
- conserves landscape character and aesthetic qualities;
- avoids exposure to natural hazards; and
- provides a healthy living environment.

To guide environmental decision-making regarding development so that it:

- Promotes good stewardship of land;
- Promotes greater efficiency of energy, land, and water use;
- Promotes rehabilitation/restoration of degraded natural areas to improve ecosystem services.

PART 3 – STRATEGIC ENVIRONMENTAL MANAGEMENT PLAN

7. OVERVIEW OF SEMP

The SEMP provides guidance to support environmental decision making that will benefit the management of important resources in the Drakenstein area.

7.1 Purpose of the SEMP

The purpose of the SEMP is as follows:

- to identify EMZs based on the environmental attributes of the area;
- to provide management guidance for the EMZs in respect of the environmental attributes that fall within that EMZ;
- to establish a framework to check the ‘on the ground’ effectiveness of the EMF; and
- to set out a mechanism to facilitate updating of the EMF and its linkages to the municipal IDP/SDF review process and to other relevant tools such as the AQMP, IWMP, catchment management and agricultural resources plans/strategies.
- To ensure sustainable land use and protection of the environment.

The SEMP therefore comprises the following:

- Environmental management zones with management recommendations.
- Listing and delisting of activities.
- Roles and responsibilities in respect of the EMF.
- Decision-making framework.
- Monitoring and evaluation framework.
- Revision/updating of the EMF.
- Integration with SDF/IDP/SoER/EMS etc.

The purpose of the SEMP must also align with the objectives of the EMF and be within the jurisdiction of the EMF.

8. ENVIRONMENTAL MANAGEMENT ZONES/ SPATIAL PLANNING CATEGORIES

Different types of resource use have different impacts on the environment. The significance of these impacts depends in part on the type of resource use proposed, and in part on the nature and attributes of the receiving environment. The focus of the EMF is on the latter, thus providing key relevant information that will determine the significance of impacts, the acceptable level of change

and the level of mitigation that would be required of development that affects a group of attributes, with similar degrees of sensitivity, in the defined area. The EMZs are identified and described in this section.

There are five (5) EMZs that are covering the entire Drakenstein geographical area, and seven town specific spatial focus area/ EMZs which have been identified based on a combination of the biophysical and socioeconomic attributes and the potential for significant impacts in relation to the activities listed in the EIA Regulations, 2014 as amended. The EMZs comprise of the following:

- Three (3) conservation focused zones; and
- three (3) development focused zones.

In determining the EMZs, the key driver must be the objectives of an EMF. Regulation 2(3) of the 2010 EMF Regulations state that EMFs must be aimed at “promoting sustainability” and “securing environmental protection.” As has been noted elsewhere in this document South Africa’s NFSD recognises that South Africa’s natural systems and biodiversity provide a basis for economic growth and development. This reality is recognised on an international and national level and has been highlighted through initiatives such as the Millennium Ecosystem Assessment. This study drew the following key conclusions⁵⁸:

1. Human activity leads to fundamental and widespread environmental change, resulting in rates of extinction a thousand times faster than background rates (Balmford 2012). “The extent of this loss should not be underestimated (Paragraph 11).”
2. The ways in which humans have altered the natural environment have led to significant benefits to society, but these benefits have been accompanied by rapidly increasing costs due to ecosystem degradation. Human activity is creating a world for future generations that is likely to be substantially degraded (Paragraph 20).
3. “It has been established conclusively that efforts to eradicate poverty will not succeed where environmental degradation is allowed to continue. This is of particular concern as environmental degradation is set to significantly worsen over the next 50 years. It therefore seems unlikely that the international community will meet its Millennium Development Goal commitments to reduce poverty and increase development, at least in the long-term. These changes may also undermine the current progress that is being made, leading to a worsening of poverty (Paragraph 25).”
4. “If the devastating impact of continued ecosystem degradation on development and the economy is to be avoided, it is clear that substantial changes will have to be made to the way in which the natural environment is valued. The case for concerted and decisive action has now been made (Paragraph 30).”

⁵⁸ These paragraphs have been cited or paraphrased from the House of Commons Environmental Audit Committee Report on the UN Millennium Ecosystem Assessment, First report of Session 2006-07 (<http://www.publications.parliament.uk/pa/cm200607/cmselect/cmenvaud/77/77.pdf>)

Similarly, the Southern African Millennium Ecosystem Assessment⁵⁹ notes that: “All people, everywhere, are absolutely dependent on ecosystem services, although well-being is also affected by many other factors... Low levels of well-being can make it difficult to focus resources on protecting ecosystem services. This can lead to a downward spiral of ecosystem degradation and declining wellbeing through the creation of a ‘poverty trap’. On the other hand, if appropriate interventions are made, it can drive an upward spiral of healthy ecosystems and rising wellbeing... At least four of the eight Millennium Development Goals [reducing hunger, reducing child mortality, combating diseases and ensuring environmental sustainability] will not be met in the southern African region unless decisive action is taken to stabilise ecosystem services.”

This same message has been acknowledged by Ms Buyelwa Patience Sonjica, formerly South Africa’s Minister of Water and Environmental Affairs, in the Foreword of a publication relating to biodiversity and development:⁶⁰ “Our experience in South Africa has shown us that we must look after our natural capital if we are to meet our country’s pressing socio-economic challenges in the face of climate change. Biodiversity and healthy ecosystems provide us with essential services – pollination of crops, a regular supply of clean water, and prevention of flooding and soil erosion. Many of the benefits derived from biodiversity and ecosystems are public goods that appear to be free, and their values are not captured in markets and prices or taken into account in decision-making, leading to loss of biodiversity, degradation of ecosystems and worsening greenhouse gas emissions. We can turn this situation around, however, by investing in maintaining and restoring our ecological infrastructure to promote development and help us adapt to climate change. This kind of investment can promote food security, ensure a sustained water supply, reduce damage from natural disasters and create work opportunities for the unemployed.”

The reason for providing the above context to the EMZs is that the EMF does provide a tool to support the change that is being sought in the way the natural environment is valued. Transformation of land on which natural systems exist is the leading cause of environmental change (Balmford 2012) and the EMF is concerned with issues related to land use and development. In particular, the fact that it is a spatial tool that is concerned with environmental attributes, means that it has a potentially significant role to play in avoiding or at least reducing the transformation of natural areas that are important assets for long-term health and wellbeing.

8.1 Identification of the EMZs

Natural resources and human endeavours are not separate from each other. Natural attributes and human activities need to be seen in the context of the landscape in which they are located. Thus, human activities and natural attributes need to be viewed holistically – as interrelated aspects of one system or landscape. Human wellbeing is related to various benefits that nature provides to humankind (referred to as ecosystem services) such as soil for growing of food crops; clean water for

⁵⁹ Biggs, R., Bohensky, E., *et al* 2004. Nature supporting people: The Southern African Millennium Ecosystem Assessment. CSIR, Pretoria

⁶⁰ Cadman, M., Petersen, C., Driver, *et al*. 2010. Biodiversity for Development: South Africa’s landscape approach to conserving biodiversity and promoting ecosystem resilience. South African National Biodiversity Institute, Pretoria.

drinking; pollination of food crops and features that fulfil recreational, cultural, or spiritual needs, to name a few. Maintaining the natural resource base is central to ensuring the wellbeing of humans and meeting their developmental needs.

The concept of “significant impact” has been applied in determining the EMZs. A significant impact is any impact that would threaten the health of either the environment and/or people in the area covered by the EMF. That is, it is an impact that would:

Threaten the integrity and resilience of ecosystems which sustain development, human wellbeing, and livelihoods, by degrading or causing deterioration or loss of:

- important biodiversity;
- ecosystems that regulate and provide reliable supply of clean water (i.e., that meets relevant water quality standards), either groundwater and/or surface water;
- air quality (i.e., air that meets relevant air quality standards);
- soils having high agricultural productivity that contribute to food security in the long term; and
- natural areas known to support livelihoods of vulnerable communities.

Threaten the physical health or increase the vulnerability of people to:

- natural hazards and/or unstable areas;
- the spread of disease; and
- pollution with known adverse health effects.

Threaten healthy societies by causing loss of:

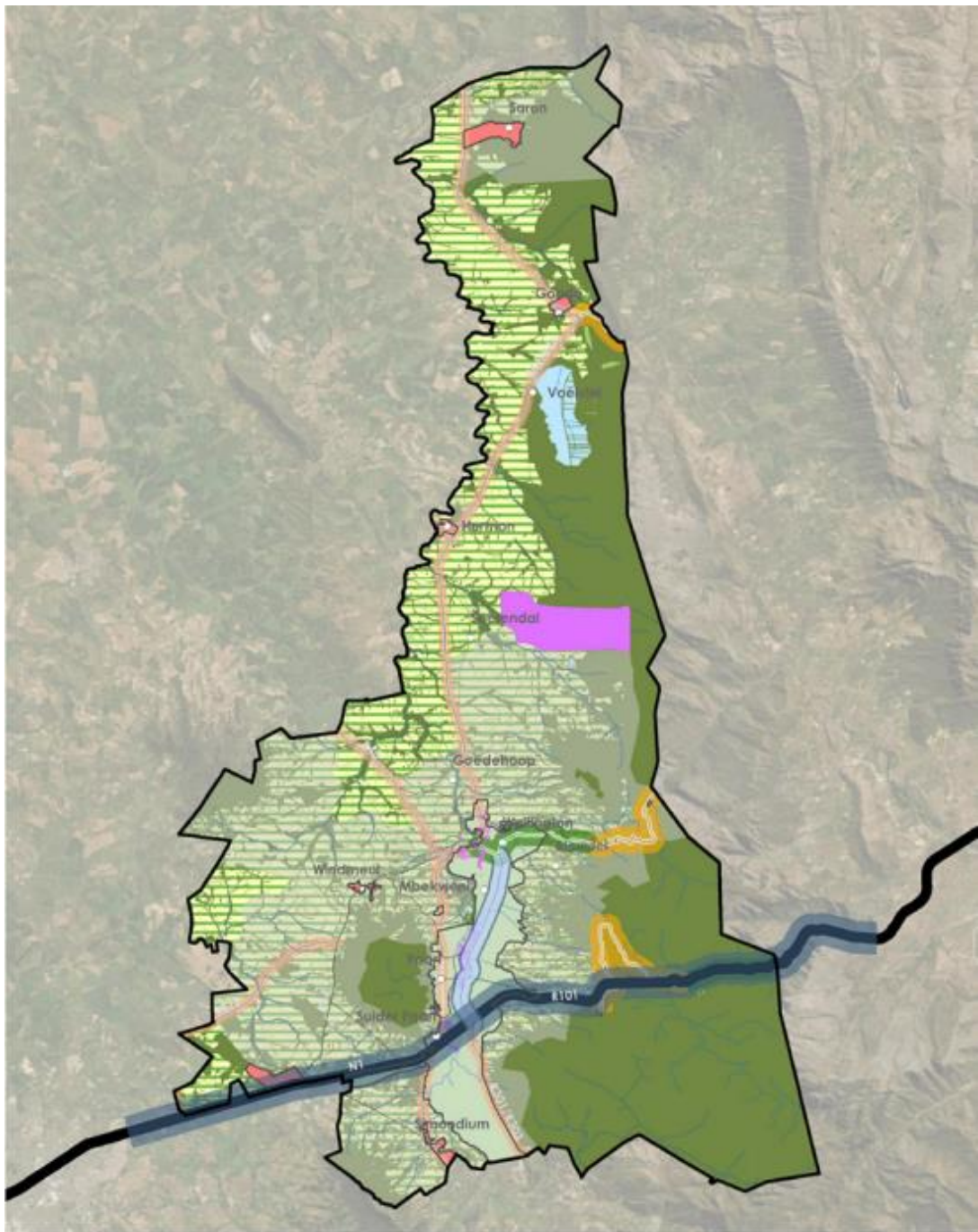
- important heritage;
- valued public open space; and
- natural areas or landscapes valued for their sense of place or that are of cultural importance.

Any activity that would be likely to cause one or more significant impacts, as defined above would be considered to be ‘undesirable’. Those impacts that are significant and also irreversible, or could result in irreplaceable loss of unique resources, should be considered as a “fatal flaw” or a “showstopper”. Developments involving transformation of land, particularly on an extensive scale would typically be of particular concern in this regard.

The approach described above is in line with the principles and goals of the PSDF and other strategic frameworks / policies developed for the Western Cape. It also reflects municipal priorities and those of stakeholders. In all these instances, protection of agricultural, biodiversity and cultural assets or resources is regarded as an imperative.

8.1.1 Description of EMZs

Spatial data has been mapped for each of the attributes in the study area. These attributes cover resources and restrictions (constraints) or risks. The status, irreplaceability and vulnerabilities associated with the attributes have been central to determining the conservation EMZs, while potential sustainable development in are EMZs (including the proximity of these areas to built/cultivated environments). Three (3) conservation focused EMZs and three (3) development focused EMZs have been determined (Refer to Map 17). as with less biophysically sensitive receiving environment was central in determining the development.



MAP 17: Environmental Management Zones are further compared with the Spatial Planning Categories of the SBM SDF

Conservation Focused Environmental Management Zones:

- ***Core 1:*** is based on areas of high ecological importance, where the aspects of the receiving environment must be kept intact and maintained. The objective of this category is to maintain or enhance the important aspects of these areas. These are offset receiving areas, that must be consolidated and left intact as far as humanly possible. Transformation of these areas must be avoided as far as possible.
- ***Core 2:*** is based on the areas of ecological importance and must be maintained and enhanced to as they play an important role in the functioning of protected areas and CBAs. Low impact activities that serve as an interface between developed areas and natural areas. Land uses that do not undermine the function of the area and enhance the incorporation of ecological aspects in urban settings.
- ***Control Development:*** is based on resources that fulfil an important supportive role in maintaining critical natural resources identified in Core 1 by means of a buffer in some areas and maintaining ecological corridors in others. Furthermore, it contains resources that may be regarded as particularly sensitive to certain types of disturbance (i.e. high impact development that may have a more significant risk in terms of severity, duration, and extent) but also considered to be more resilient to low impact (i.e. impacts that are considered having lower risk in terms of severity, duration, and extent) developments. Therefore, controlled development would be allowed within this EMZ thereby reducing the need for development in more vulnerable receiving environments. In addition, this zone also considers competition area whereby you want to contain the proposal.

Development Focused Environmental Management Zones:

- ***Agricultural Development Zone:*** This EMZ is informed by existing agricultural areas and aims at protecting and retaining productive agricultural land that is vital for ensuring food security. These areas are of high agricultural importance and must be maintained as such. Suitable proposals must be agricultural in nature, including both intensive and extensive agriculture, and agri-processing.

This Agricultural Development Zone can be compared with the Agriculture Spatial Planning Category of the Drakenstein Municipality's Spatial Development Framework.

- ***Industrial / Mining Development Zone:*** This EMZ considers the major role industrial mining development plays in the region and aims to promote industrial mining development in less vulnerable areas to ensure sustainable economic development. These areas are well located for industrial/mining land uses. However, common pool resources, such as air quality, must be closely monitored in order to ensure that the crowding of pollution emitters within these areas does not give rise to an environment that is harmful to the health of employees and neighbouring communities. Buffering between these areas and others, such as residential land uses, must be considered.

- **Urban Development Zone:** This EMZ considers the need for service delivery and aims to promote service-related development in less sensitive areas to ensure sustainable urban development. These areas are well located for urban development. The objective of this category is to promote the development of these areas in a way that does not undermine sense of place.

The EMZs provide a means for achieving the following requirements as set out in the 2010 EMF Regulations, in that they serve to:

- Specify the attributes of the environment in the area, including the sensitivity, extent, interrelationship, and significance of those attributes.
- Identify any parts in the area to which those attributes relate.
- Show the environmental management priorities of the area.
- Indicate those areas with specific environmental and socio-cultural values and the nature of those values.

These EMZs could be regarded as a tool to assist Applicants or Developers in identifying appropriate locations for development proposals and for providing a “first scan” of the issues that may need to be addressed in the application process (e.g., through specialist studies). Clearly, the more responsive the application is to the EMZ information the lower the risk of conflict with stakeholders / I&APs and of authorisation being refused. The converse also applies.

8.2 Management guidelines for the EMZs

Since the purpose of the EMF is to consider the environmental attributes of an area and to use this information to provide guidance with respect to appropriate/inappropriate development, the following has been developed for each EMZ:

A management framework which can be used as a basis for testing development proposals or for developing objectives/goals for a development proposal (i.e., objectives-led planning and design of a development proposal). The management framework comprises the following:

- **Zone aim:** The overarching vision of what the zone intends to achieve.
- **Desired outcomes:** These are the effects that one would want to see “on the ground”, namely the results of giving effect to the objectives.
- **Limits of Acceptable Change:** these are thresholds that need to be considered in the planning of land use and development and in related decision-making processes. They represent a limit beyond which change in the current status of that particular attribute would be regarded as undesirable because of the potential for loss or degradation of an irreplaceable resource. These limits are based on the best available scientific information.
- **Opportunities for benefit:** these represent areas where social and/or economic and/or environmental benefits could be realised.

- **Mitigation options:** these show the level of mitigation in the mitigation hierarchy that could be used to address impacts on particular attributes. Where the attributes/resources are irreplaceable, avoidance (rather than minimising, rehabilitating, or offsetting) is likely to be the sole option.

A matrix linking attributes and activities/types of development that may be considered inappropriate or appropriate. The activities in this matrix are based on the Listed Activities in the 2014 EIA Regulations, as amended. This matrix should only be used as being indicative of developments that may or may not be appropriate – it is not to be taken as being definitive, as each application must be evaluated on its own merits.

Each EMZ will outline the above framework in the form of a descriptive table.

All proposed developments in each EMZ should be evaluated to ensure that:

- It would meet the management objectives for this zone and preferably result in net benefit both for the ecological and social environment; and
- Changes induced by proposals would not exceed limits of acceptable change.

The management objectives, desired outcomes and limits of acceptable change that have been provided for each attribute within each EMZ have been formulated based on sustainability principles. It is necessary for the EMF to be framed within these principles for it to guide the formulation of appropriate development proposals and environmental decision-making effectively, within its “scope of influence.” This means that it must be borne in mind that the EMF is a tool that is aimed at supporting the implementation of the EIA Regulations. Thus, it cannot be the sole mechanism whereby sustainability objectives would be achieved.

From the perspective of development proponents, the information in respect of each EMZ can be used to guide the formulation of the development/project proposal. The objective is to achieve development proposals that are aligned with, and hence do not undermine, sustainability objectives. Similarly, the management objectives, desired outcomes, and limits of acceptable change ought to be considered in decision-making.

The information on environmental attributes that has been used in the EMF is the most recent available from the various organisations or institutions that house these data. Applicants and their consultants must ensure that the latest GIS database is consulted and not rely solely on the maps published (i.e., hard copy) in the EMF. The GIS information is available from the DEA&DP as well as the Drakenstein Municipality.

Where an attribute intersects a particular location or property, this points to the need to investigate this issue as part of the EIA process. This would normally involve consulting a relevant specialist to assist in undertaking a more detailed investigation of the issue. Typically, this would involve ‘groundtruthing’ to verify the presence of the attribute at the specific location as well as its

surroundings, since environmental impacts may extend beyond the boundaries of a site. In cases where scientific (specialist) studies are at variance with the EMF (e.g., area identified as being sensitive in the EMF is not found to be sensitive in a specialist study), the onus is on the Applicant and the Environmental Assessment Practitioner (EAP) to ensure that the scientific analysis is rigorous, that findings have been discussed with relevant authorities and, preferably, that the study concerned has been subject to peer review, if required by the competent authority. **The burden of proof to demonstrate that a development proposal is aligned to the EMF lies with the project proponent/applicant.**

8.2.1 Road map for using the EMZ information

A summary for the application of the EMZ information is provided in the flow diagram below.

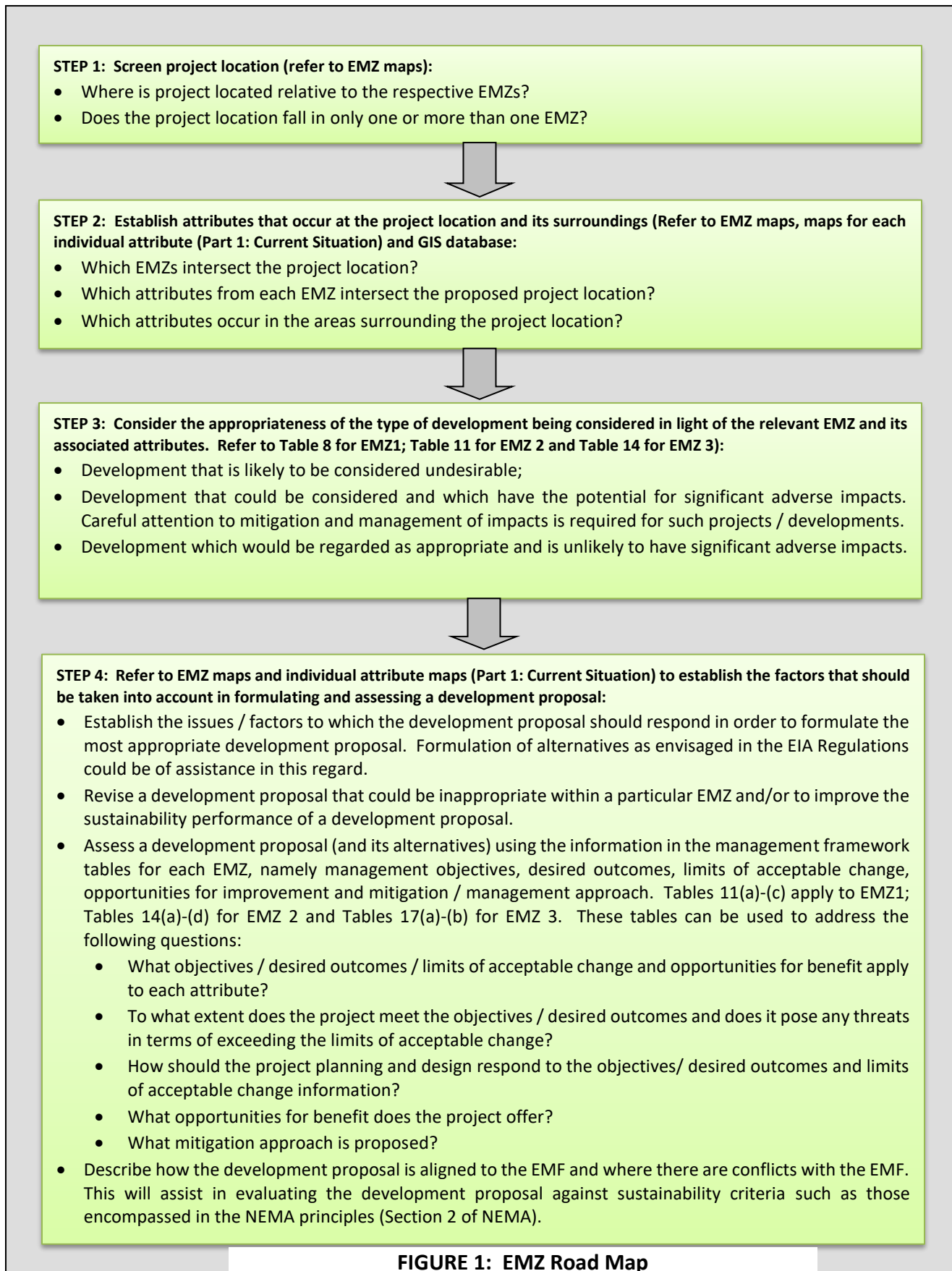


FIGURE 1: EMZ Road Map

8.3 Environmental Management Zones- Attributes and Actions

8.3.1 Core 1 / Core 2 / SPC: Core 1, Core 2

These zones were established with the intention of comprising areas of high conservation importance that must be protected from change and only non-consumptive land-uses may be allowed conditionally. These zones contain the following: Core 1 Areas are those parts of the rural landscape required to meet targets/ thresholds for biodiversity patterns or ecological processes (i.e., Protected Areas and Critical Biodiversity Areas). These include habitats classified as highly irreplaceable, critically endangered, or endangered terrestrial (land), aquatic (rivers, wetlands, and estuaries) and marine habitats. These also include areas currently not yet exhibiting high levels of biodiversity loss, but which should be protected and restored, to ensure biodiversity pattern and ecological process targets/thresholds can be met, in the most efficient way possible. It also includes essential biological corridors vital to sustain their functionality⁶¹.

Then Core 2 comprised areas in a degraded condition that are required to meet biodiversity targets, for species, ecosystems or ecological processes and infrastructure. These areas should be rehabilitated and only low-impact, biodiversity-sensitive land-uses are appropriate. Core 2 also includes Ecological Support Areas (ESA), that are not essential for meeting biodiversity targets but play an important role in supporting the ecological functioning of CBAs and deliver important ecosystem services. They facilitate landscape connectivity, promote resilience to climate change, and buffer elements of the landscape including Protected Areas and sites that are important for the survival of individual species⁶².

| CORE 1 / CORE 2 | | |
|--|---|--|
| ATTRIBUTE | RATIONALE | COMMENTS/NOTES |
| <ul style="list-style-type: none"> CBA1 | <ul style="list-style-type: none"> Protect Critical Biodiversity Areas (CBAs) and Ecosystem Support Areas, and incorporate CBAs into Protected Areas network. Protect CBAs and ESAs, and incorporate CBAs into Protected Areas network, especially on the lower slopes of the Obiekwaberg and | <ul style="list-style-type: none"> The ecological functionality for the area must be maintained or enhanced. Low impact development that does not undermine function can be considered. These areas could be used as positive interfaces with abutting land uses. |

⁶¹ Page of 17 DEA&DP. 2019. Western Cape Land Use Planning Guidelines Rural Areas, 2019.

⁶² Page 19 and 20.

| | | |
|--|---|---|
| | <p>extending into the Klein Berg River riverine corridor north of Gouda</p> | <ul style="list-style-type: none"> Measures to maintain or enhance ecological importance of the receiving environment must be implemented. Low impact activities such as trails, environmental education, can be allowed. No development/physical structures should be allowed without detailed project level investigation. |
| <ul style="list-style-type: none"> Core 1 (Protected Areas) | <ul style="list-style-type: none"> Implement and manage proposed Stewardship Sites: Wellington Industrial Area; Eerste Tol (Bainskloof) and Happy Valley (Farm 229/0, Wellington). Encourage environmental education and non-consumptive low-impact eco-tourism. Maintain and protect natural areas that surround Wellington. | <ul style="list-style-type: none"> Measures to maintain or enhance ecological importance of the receiving environment must be implemented. Low impact activities such as trails, environmental education, can be allowed. No development/physical structures should be allowed without detailed project level investigation The management plan must identify allowable activities, which should be consistent at least with the CBA Irreplaceable category; the location of these allowable activities should be captured in a zonation plan in the management plan. |

| | | |
|--|---|--|
| <ul style="list-style-type: none"> • Aquatic CBAs | <ul style="list-style-type: none"> • .Protect Critical Biodiversity Areas and wetlands and management of floodplains. • Rehabilitate and protect riverine corridors (Berg River and tributaries). • Protect water resources from unregulated groundwater uses and from water pollution. • Ecosystem management, catchment management, pollution control and riparian zone management programmes. • Protect freshwater ecosystems and prevent further loss of wetlands. | <ul style="list-style-type: none"> • Freshwater CBAs should be maintained in good ecological condition, and those that are degraded should ideally be rehabilitated to a good condition. • Land use practices or activities that will lead to deterioration in the current condition of a freshwater CBA, or that will make rehabilitation difficult, are not acceptable. • Any proposed land use change must be subject to an EIA as it is likely to impact on the ecological drivers of the river or wetland ecosystem and can, potentially, alter its functioning or lead to loss of species. • Maintain the riparian vegetation and a buffer from other land uses along watercourses and implement rehabilitation measures where there is erosion or other degradation present. • 10 Specialist studies by a freshwater ecologist should be conducted if there is a watercourse |
|--|---|--|

| | | |
|--|--|---|
| | | that is likely to be affected. |
| CORE 1 / CORE 2 | | |
| ATTRIBUTE | RATIONALE | COMMENTS/NOTES |
| <ul style="list-style-type: none"> Core 2 | <ul style="list-style-type: none"> Promote quality multi-use open space areas – reclaim and repurpose open spaces. Connectivity of green corridors and integration of natural areas with urban green areas. | <ul style="list-style-type: none"> The ecological functionality for the area must be maintained or enhanced. Low impact development that does not undermine function can be considered. These areas could be used as positive interfaces with abutting land uses. |
| <ul style="list-style-type: none"> Private Reserves (within Urban and Industrial Areas) | <ul style="list-style-type: none"> Maintains healthy ecosystems and prevent disturbance by human activities in the long term. Meet national targets through informal conservation areas. Provides a wilderness experience for people. | <ul style="list-style-type: none"> Much land in SA is privately owned and contains an array of biodiversity. Consequently, it is important to conserve these areas to maintain biodiversity and ecosystem functioning. Private landowners have the potential to play an important role in conservation of biodiversity through the controlled public access and sustainable use of the land. |
| CORE 1 / CORE 2 | | |
| ATTRIBUTE | RATIONALE | COMMENTS/NOTES |
| <ul style="list-style-type: none"> CBA2 | <ul style="list-style-type: none"> CBA2 areas that are degraded, should be rehabilitated, and allow for low-impact land use to occur. | <ul style="list-style-type: none"> Activities that have minimal impact on biodiversity and the receiving environment |

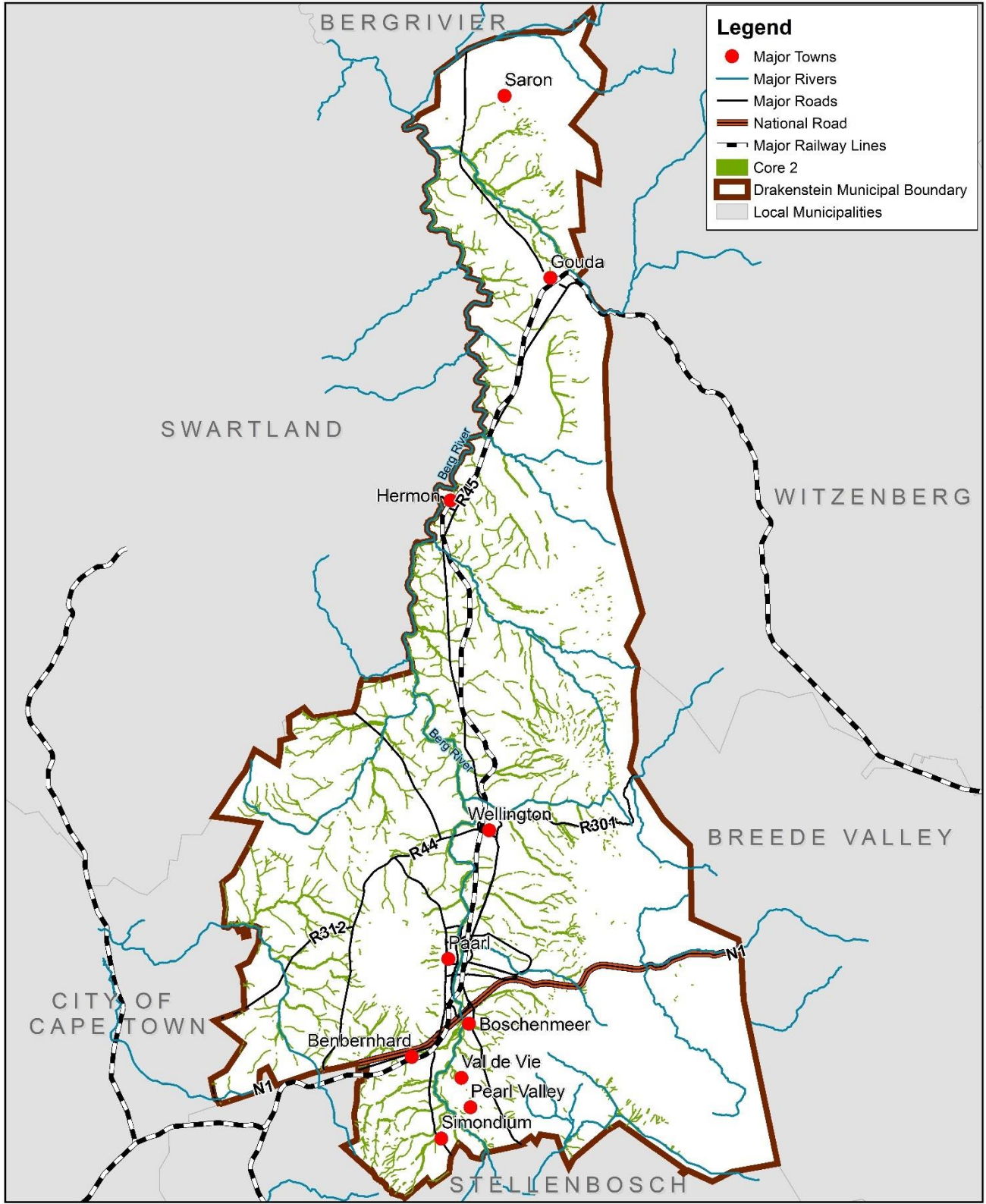
| | | |
|---|---|--|
| | | can be undertaken in these areas. |
| <ul style="list-style-type: none"> • ESA2 | <ul style="list-style-type: none"> • ESA2 areas focus on restoration and managing the impacts on ecosystem functioning. | <ul style="list-style-type: none"> • These areas can allow for a degree of habitat loss for restoration purposes provided that the ecological functioning of the ecosystem is not disrupted. |
| CORE 1 / CORE 2 | | |
| ATTRIBUTE | ATTRIBUTE | ATTRIBUTE |
| <ul style="list-style-type: none"> • Protected Area Expansion Strategy | <ul style="list-style-type: none"> • These area areas identified as important in meeting international commitments associated with the expansion of protected areas. | <ul style="list-style-type: none"> • With the intention of ensuring that South Africa meet commitments set in terms of the Convention of Biological Diversity, national targets are set for the expansion of protected areas. Maps are produced to indicate potential areas for expansion |

Table 5: Attributes that inform Core 1 / Core 2

The attributes set out in the table above were used as an informant for the development of the Core zone which encompasses the following spatial planning categories Core 1 and Core 2, which are shown spatially on Map 18-19 below. Conservation Zone includes rural areas, urban area and also areas that require restoration. Applicants and EAPs are advised to consult the GIS database that forms part of this EMF to ensure that all the relevant environmental attributes are identified for the project location and that the most accurate and up-to-date information is being consulted. Specialist studies would always be required for “ground truthing” purposes in respect of Core 1 and Core 2. Such ground truthing would also be valuable in determining the extent of the impact assessment required.

MAP 18: Core 1

EMZ - Core 2



Legend

- Major Towns
- Major Rivers
- Major Roads
- National Road
- - - Major Railway Lines
- Core 2
- ▭ Drakenstein Municipal Boundary
- ▭ Local Municipalities

| | | | | |
|--|--|---------------------------------|---|--|
| | Created By: DEA&DP (Spatial Information Management) | Drakenstein Municipality | Date : 08 Nov 2021 Scale : 1:400 000 | <p>DISCLAIMER Liability disclaimed. Use at own risk.</p> Western Cape Government Environmental Affairs & Development Planning |
| | Scale: Kilometers | | | |

MAP 19: Core 2

The management framework for Core 1 and 2 can be found in Table 7 below

| CORE 1 / CORE 2 | | |
|---|---|---|
| ZONE AIM | MANAGEMENT OBJECTIVES | DESIRED OUTCOME |
| <ul style="list-style-type: none"> • Promotion of conservation and protection of irreplaceable resources and biodiversity, under significant development pressure. • Promotion of restoration to ensure protection of resources and continued ecological functioning. | <ul style="list-style-type: none"> • To ensure protection and conservation of irreplaceable ecosystems and ecological features. To ensure sensitive areas are kept intact and in a near natural state. • To ensure rehabilitation and restoration of ecosystems in less sensitive areas. To offset the negative impacts development may render on ecosystems. Controlled expansion of sensitive and protected areas to ensure maximum protection of biodiversity. | <ul style="list-style-type: none"> • Maintain in a natural or near-natural state, with no further loss of natural habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate. • Maintain in a functional, natural, or near-natural state, with no further loss of natural habitat. These areas should be rehabilitated. • Maintain in a natural or near-natural state, with no further loss of natural habitat. Degraded areas should be rehabilitated. Only low-impact, biodiversity-sensitive land uses are appropriate. • Must be kept in a natural state, with a management plan focused on maintaining or improving the state of biodiversity. A benchmark for biodiversity. |

| | | <ul style="list-style-type: none"> • Restriction of development where it may cause further degradation to ecosystems. To maintain ecological functioning of the ecosystem. To protect the goods and services, the ecological infrastructure provides (e.g. flood attenuation). • The restoration of ecosystems and habitats to achieve conservation targets. Increased conservation and protected biodiversity through establishment of Protected Areas. Increase of restored habitats through conservation initiatives. |
|---|--|--|
| LIMIT OF ACCEPTABLE CHANGE | OPPORTUNITY FOR BENEFIT | MITIGATION/MANAGEMENT APPROACH |
| <ul style="list-style-type: none"> • No loss of ecosystem functioning to a point where conservation targets (e.g. CBA targets) are compromised. • No development should be allowed in any sensitive and protected areas (i.e. within the Conservation Zone). • Low impact development that | <ul style="list-style-type: none"> • The promotion of community based natural resource projects (e.g., community projects such as the “Working for Water” and “Working for Wetlands” projects which focus on the removal of alien invasive species in wetlands and rivers). | <ul style="list-style-type: none"> • Avoid. Limited development should be undertaken in these areas. If development is unavoidable, biodiversity offsets may be considered to meet conservation targets. • Relevant specialist studies must be undertaken for any development being undertaken within the |

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| <p>results in minimal loss of habitat may be allowed on condition that the ecosystem is not compromised in any way. No high impact development should be allowed (in rural areas).</p> <ul style="list-style-type: none"> • Buffers must be allocated and protected. | <ul style="list-style-type: none"> • Conservation projects in urban areas (e.g., environmental educational programmes). Increased quality and quantity of ecosystem goods and services resulting in increased social, economic, and environmental benefits. | <p>zone. Study must include appropriate mitigation measures.</p> <ul style="list-style-type: none"> • Establish partnerships with NGOs and other stakeholders to develop tools and projects to manage the social ecological systems within urban areas. |
| APPROPRIATENESS MATRIX | | |
| COMPATIBLE LAND USE | | |
| <ul style="list-style-type: none"> • Passive recreational activities. • environmental education centres. • Conservation areas. • Inside urban areas. • Light activities, such as ecotourism, trails. | | |

Table 6: Management Framework for Core 1/ Core 2

8.3.2 Controlled Development Zone

The controlled development zone was established with the intention of ensuring sustainable development on landscapes that can withstand marginal impacts. Development activity is allowed if controlled and monitored in a sustainable manner. This zone contains heritage and scenic resources that are important to society for sense of place and an element of wilderness.

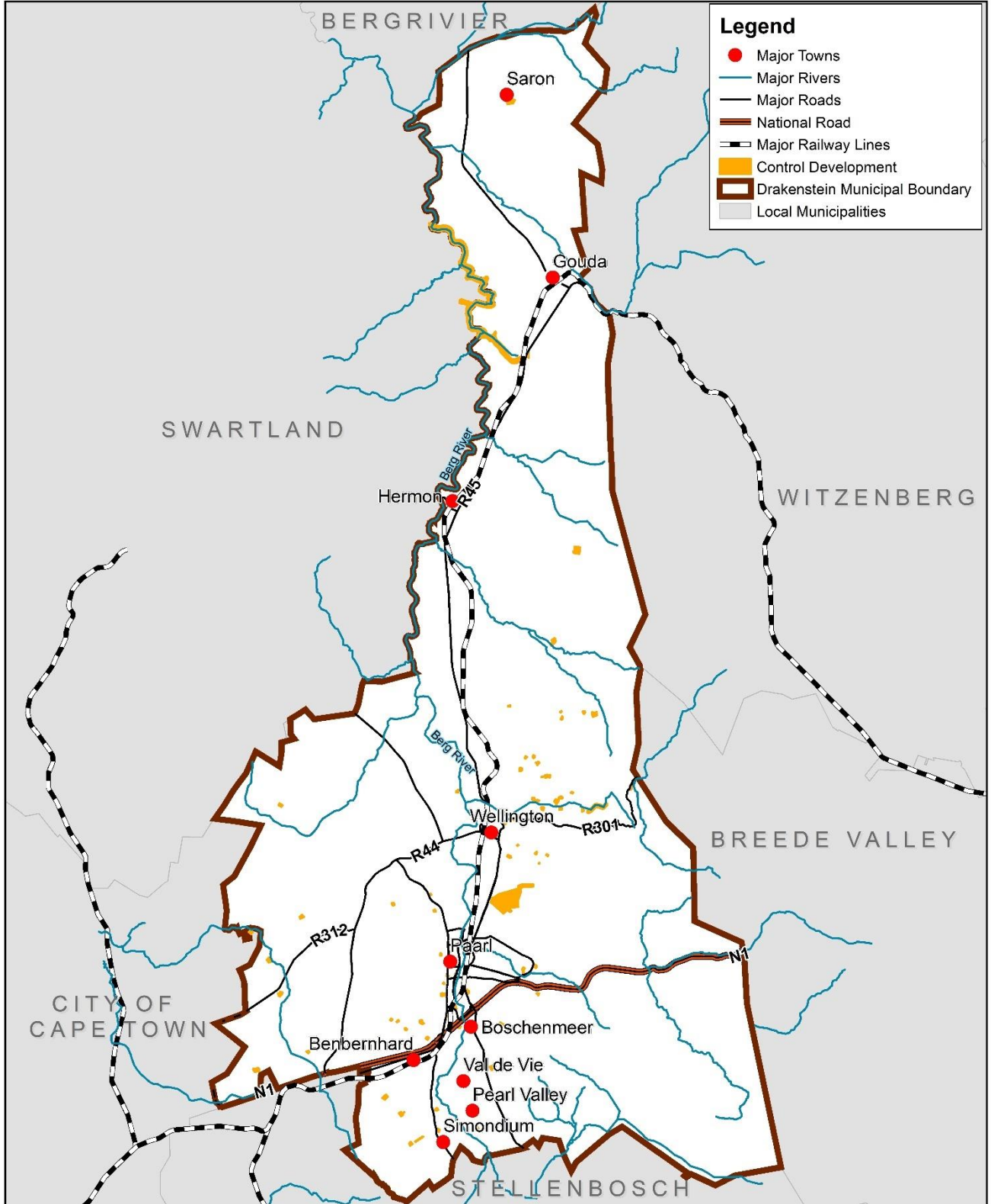
| CONTROLLED DEVELOPMENT ZONE | | |
|---|---|--|
| ATTRIBUTE | RATIONALE | COMMENTS/NOTES |
| <ul style="list-style-type: none"> • Mountains | <ul style="list-style-type: none"> • Restrict up-slope development on Wemmershoek and Simonsberg Mountains | <ul style="list-style-type: none"> • These landscapes attract developers due to their high aesthetic value and untouched natural resource base thus increasing tourism opportunities. |
| <ul style="list-style-type: none"> • Buffer | <ul style="list-style-type: none"> • Rehabilitation of rivers, streams, and buffer | <ul style="list-style-type: none"> • To be determined case by case basis. |

| | | |
|---|--|---|
| | <p>areas, to create natural corridors.</p> <ul style="list-style-type: none"> • Rehabilitate and protect riverine corridors (Krom, Spruit and Leeuwen Rivers). • Apply buffer areas around wetlands and core areas. • Extend the river setback, to retain an agricultural buffer along the Berg River. • Extend river setback to retain an agricultural buffer along the river that runs through the FA. | |
| <ul style="list-style-type: none"> • Flood lines | <ul style="list-style-type: none"> • Determine the 1:100-year floodline. | <ul style="list-style-type: none"> • Development along the floodplains and catchment areas should be controlled to reduce the risk of flooding adjacent to rivers. The 1:100year flood line accounts for climate change predictions. |
| <ul style="list-style-type: none"> • Urban Edge | <ul style="list-style-type: none"> • Contain the urban footprint within the urban edge. • Prevent ad-hoc outward expansion of urban settlements by maintaining tight urban edges. • Contain future proposed development within the urban edge and maintain a tight urban edge. | <ul style="list-style-type: none"> • To be determined case by case basis. |

Table 7: Attributes that inform Controlled Development

The attributes set out in the table above were used as an informant for the development of the Controlled Development Zone, which is shown spatially on Map 20 below. Applicants and EAPs are advised to consult the GIS database that forms part of this EMF to ensure that all the relevant environmental attributes are identified for the project location and that the most accurate and up-to-date information is being consulted. Specialist studies would always be required for “ground truthing” purposes in respect of any listed activities. Such ground truthing would also be valuable in determining the extent of the impact assessment required. The management framework for this EMZ can be found in Table 9 below.

EMZ - Control Development



Legend

- Major Towns
- Major Rivers
- Major Roads
- National Road
- Major Railway Lines
- Control Development
- ▭ Drakenstein Municipal Boundary
- ▭ Local Municipalities

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DEA&DP (Spatial Information Management)

Scale:
0 2 4 8 12
Kilometers

Drakenstein Municipality

Date : 08 Nov 2021
Scale : 1:400 000

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MAP 20: EMZ - Control Development

| CONTROLLED DEVELOPMENT | | |
|---|--|--|
| ZONE AIM | MANAGEMENT OBJECTIVES | DESIRED OUTCOME |
| <ul style="list-style-type: none"> Sustainable development on landscapes that can withstand marginal impacts. | <ul style="list-style-type: none"> To minimise the loss of intact habitat which play an important role in the conservation of threatened species. To ensure that development within high-risk areas (such as coastal setback lines and flood lines) are controlled. To prevent fragmentation by maintaining ecological corridors and by acting as a buffer for areas of high biodiversity importance. | <ul style="list-style-type: none"> To retain aesthetic appeal of the landscape. To reduce the development within areas vulnerable to change. Protection of irreplaceable resources (conservation zones). |
| LIMIT OF ACCEPTABLE CHANGE | OPPORTUNITY FOR BENEFIT | MITIGATION/MANAGEMENT APPROACH |
| <ul style="list-style-type: none"> Controlled development should not hinder the objective of the zone (i.e. ecological corridor and buffer). Ecological disruption from development must be minimised as far as possible to prevent substantial detrimental consequences from arising (must not have a negative impact on CBAs and PAs). | <ul style="list-style-type: none"> Potential for controlled low impact development, thereby allowing for protection of more sensitive resources in EMZ 1 and 2. Potential for controlled developments that enhance the value of more sensitive resources (e.g. ecotourism development). | <ul style="list-style-type: none"> Where development is proposed, relevant specialist input to be attained to generate mitigation strategies that may offset the negative impacts of the proposed development. Limit the type of development - only low impact development should be acceptable (such as certain linear service infrastructure). |

| | | |
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| Controlled low impact development could be allowed in these areas. | | <ul style="list-style-type: none"> Where higher impact development cannot be avoided, development should be compatible with the zone aim to enhance biodiversity protection (e.g. ecotourism) |
| APPROPRIATENESS MATRIX | | |
| COMPATIBLE LAND USE | | |
| <ul style="list-style-type: none"> Land uses that integrate environmental management categories with surrounding land uses | | |

Table 8: Management Framework Controlled Development Zone

8.3.3 Agricultural Development Zone

This zone was established to promote sustainable agricultural development with the intention of boosting the economy while conserving natural resources. The agricultural sector is important to the local economy and job creation in the area. Therefore, sustainable agricultural development is critical for resources that are important for food security, livelihoods, economic activity, and job creation.

| EMZ: AGRICULTURAL DEVELOPMENT | | |
|---|--|---|
| ATTRIBUTE | RATIONALE | COMMENTS/NOTES |
| <ul style="list-style-type: none"> Intensive agriculture - High Value Agricultural Land (High Land Capability) | <ul style="list-style-type: none"> Retain and protect high-value and unique agricultural land. Protect agricultural land from ad hoc transformation. Prevent urban encroachment into high-potential agricultural areas. | <ul style="list-style-type: none"> Prevent agricultural encroachment into floodplains and riparian areas. Promote conservation agriculture. |
| <ul style="list-style-type: none"> Smallholdings and agricultural areas | <ul style="list-style-type: none"> Promote urban agriculture and small-scale farming opportunities. Proposed household gardens, school gardens and | |

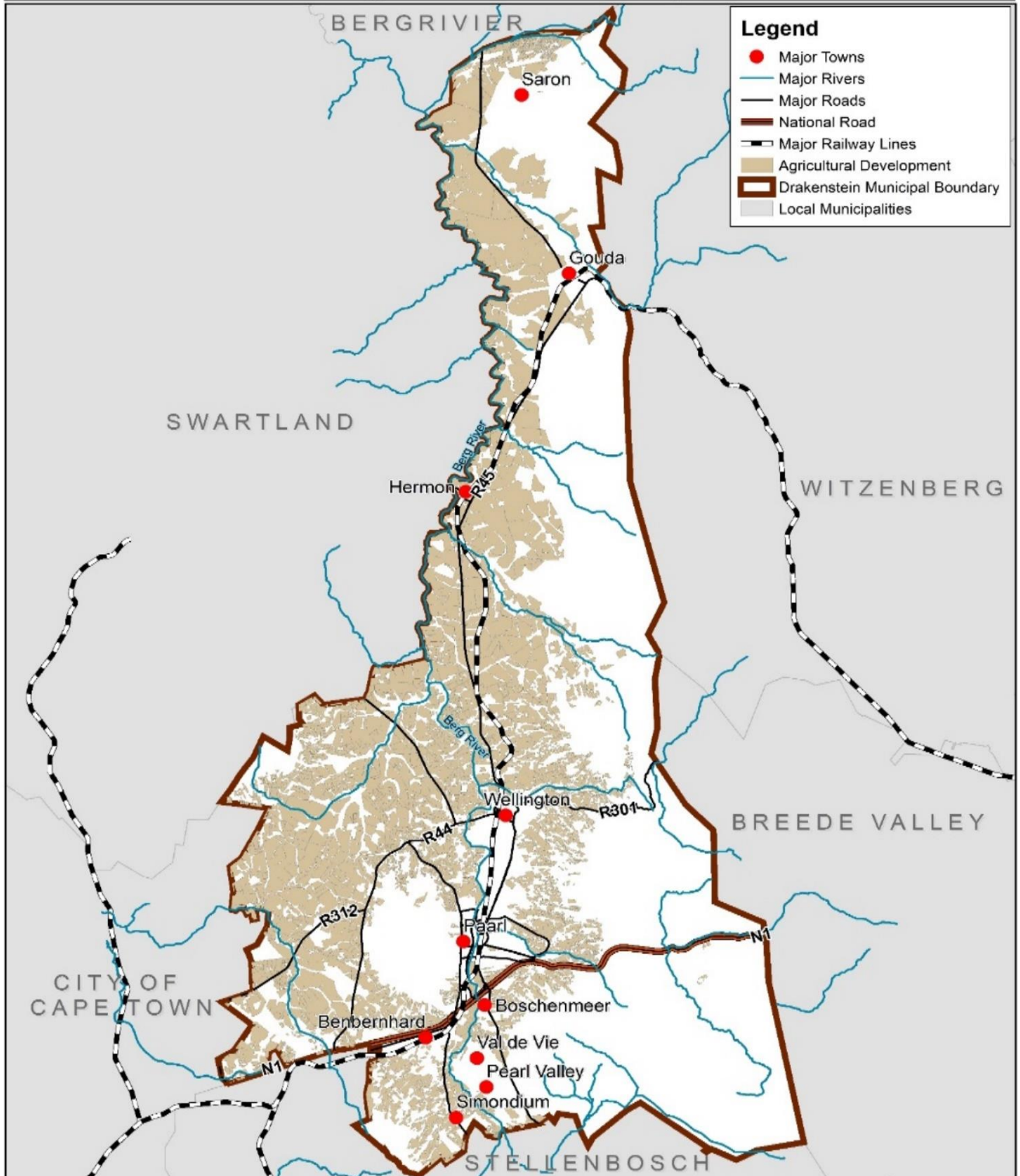
| | | |
|--|---|--|
| | <p>community gardens, in partnership with relevant departments and human settlement projects.</p> <ul style="list-style-type: none"> • Urban agriculture: food gardens on top of buildings and at vacant land within urban area, and small-scale farming opportunities to enable the production of local produce that can be sold at informal trading spaces. • Protect agricultural land from any further subdivision into urban townships or small-holding areas. | |
| <ul style="list-style-type: none"> • Intensive agriculture (high potential and unique agricultural land): | <ul style="list-style-type: none"> • Prevent further loss of high-potential agricultural land. • To ensure that high value agricultural land, pending availability, are preserved for continued agricultural production, thereby ensuring long-term national food security | <ul style="list-style-type: none"> • Diversify crops, planting berries instead of grapes, to adapt to climate change |
| <ul style="list-style-type: none"> • Irrigated agriculture | <ul style="list-style-type: none"> • These areas are important for grain crop production and food security. • Compile an integrated agricultural development plan to give effect to transformation of the commonage (i.e. irrigated land and grazing). | <ul style="list-style-type: none"> • Drakenstein contains several irrigated areas that are vital for agricultural activity. |

| | | |
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| | <ul style="list-style-type: none"> • Explore opportunities for allotments within existing irrigated footprints, for agrarian reform purposes outside of the Berg River riparian zone. • Protect the irrigated agricultural footprint. | |
| <ul style="list-style-type: none"> • Peri urban farming | <ul style="list-style-type: none"> • Community gardens, with a 'leivoor' network, are proposed for development, to improve the distribution of water for urban agricultural use. | |
| <ul style="list-style-type: none"> • Extensive agriculture | <ul style="list-style-type: none"> • Explore opportunities for extensive agrarian reform (livestock) and agri-processing orientated LED programmes. | |

Table 9: Attributes that inform Agricultural Development

The attributes set out in the table above were used as an informant for the development of the Agricultural Development Zone, which is shown spatially on Map 21 below. Applicants and EAPs are advised to consult the GIS database that forms part of this EMF to ensure that all the relevant environmental attributes are identified for the project location and that the most accurate and up to-date information is being consulted. Specialist studies would always be required for “ground truthing” purposes in respect of any listed activities. Such ground truthing would also be valuable in determining the extent of the impact assessment required. The management framework for this EMZ can be found in Table 11 below.

EMZ - Agricultural Development



Legend

- Major Towns
- Major Rivers
- Major Roads
- National Road
- Major Railway Lines
- Agricultural Development
- ▭ Drakenstein Municipal Boundary
- Local Municipalities

| | | | | |
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| | Scale:  | | | |

MAP 21: Agricultural Development Zone

| AGRICULTURAL DEVELOPMENT ZONE | | |
|---|--|--|
| ZONE AIM | MANAGEMENT OBJECTIVES | DESIRED OUTCOME |
| <ul style="list-style-type: none"> Boosting the economy while conserving resources, through sustainable agricultural development. | <ul style="list-style-type: none"> To protect and retain productive agricultural land that is vital for ensuring food security. Reduce requirements for undertaking development. To ensure that high value agricultural land, pending availability, are preserved for continued agricultural production, thereby ensuring long-term national food security. | <ul style="list-style-type: none"> Agricultural transformation and development on land that is important for ensuring food security and sustenance of livelihoods Transformation of land for agricultural development for increased agricultural production. |
| LIMIT OF ACCEPTABLE CHANGE | OPPORTUNITY FOR BENEFIT | MITIGATION/MANAGEMENT APPROACH |
| <ul style="list-style-type: none"> Only agricultural development (including auxiliary infrastructure) may take place in productive agricultural land. Subdivision and fragmentation of agricultural land must be avoided. Loss of irrigated agricultural land must be prevented as far as possible | <ul style="list-style-type: none"> Improvement of ecosystem services through proper management and sustainable agricultural development. The potential for community -based projects around sustainable agricultural practice and natural resource management. Increased food security for the region. Increased job creation based on agricultural development. Intensified agricultural practices and vertical expansion to utilize the | <ul style="list-style-type: none"> Avoid development on areas of high productivity. Relevant specialist studies must be undertaken to identify areas of potential development and impacts. Thereafter, potential mitigation strategies may be devised. |

| | | |
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| | available land more effectively. | |
| APPROPRIATENESS MATRIX | | |
| COMPATIBLE LAND USE | | |
| <ul style="list-style-type: none"> • Agricultural use. • Secondary uses compatible to the primary agricultural use. • The uses to make a positive contribution to the agricultural industry, either directly or indirectly. • Farm settlement. • Intensive and extensive agriculture. • Agri-processing. • Conservation. • Eco-tourism. • Farm: Productive and/or subsistence farm, crop growing, grazing, stock farm, game farm, fish breeding, equestrian centre and schools, vegetable gardens and forest plantations, etc., including necessary farm dwelling unit/s and outbuildings as well as farm stall for selling of goods produced on the farm. • Agro-business: Butchery, nursery, fresh produce market, dairy, chicken hatchery and kennels. • Agro-industrial: Packers, sawmill, canners, processing plants for agricultural products and an abattoir. | | |

Table 10: Management Framework for Agricultural Development Zone

8.3.4 Industrial/Mining Activity Zone

The industrial activity zone was established with the intent to promote industrial development in areas that are less vulnerable to industrial pressures and areas that have the potential to support industrial development in a sustainable manner. The industrial activity zone will act as a catalyst for sustainable economic development as well as job creation in the area.

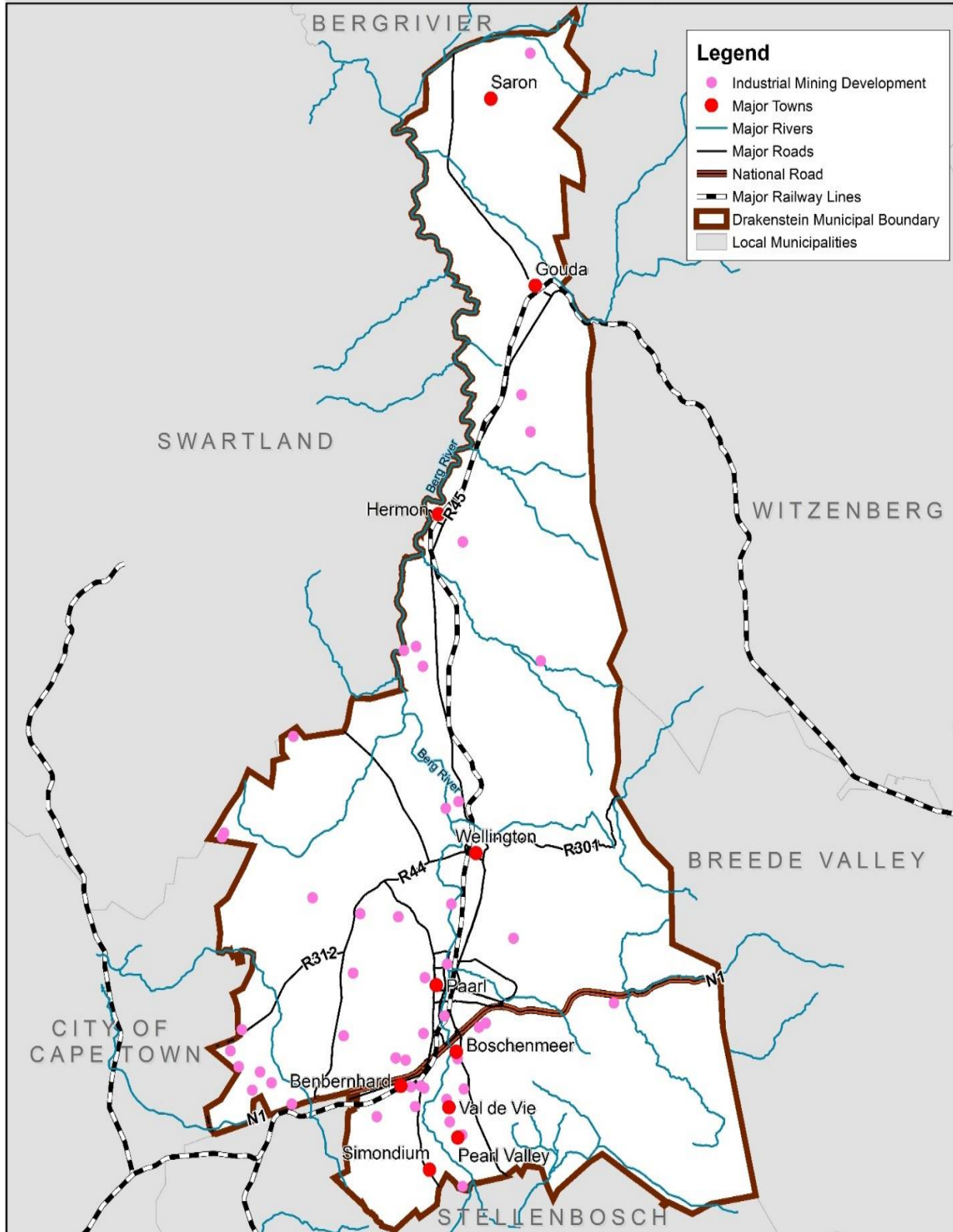
| INDUSTRIAL/ MINING ACTIVITY ZONE | | |
|---|--|---|
| ATTRIBUTE | RATIONALE | COMMENTS/NOTES |
| <ul style="list-style-type: none"> • Industrial Zoning and Industrial expansion. | <ul style="list-style-type: none"> • The expansion of industries in this area has the potential to promote job creation and increased economic growth, in a sustainable manner. | <ul style="list-style-type: none"> • The IDZ will act as a catalyst to ensure industrial investment thus creating jobs and ensuring sustainable development within the area. |

| | | |
|--|---|---|
| | <ul style="list-style-type: none"> • The ease of doing business within Drakenstein is facilitated within the Economic Growth section in order to attract and retain investors and ensure that the municipality becomes an investment destination of choice | |
| <ul style="list-style-type: none"> • Industrial Development | <ul style="list-style-type: none"> • Promote light industrial and commercial business hub • There is the potential to incentivise green industry business in existing industrial areas | <ul style="list-style-type: none"> • Industrial development should aim to concentrate pollution related activities to within the already polluted area to enable more effective management and mitigation. |

Table 11: Attributes that inform Industrial/ Mining Activity

The attributes set out in the table above were used as an informant for the development of the Industrial/ Mining Activity Zone, which is shown spatially on Map 22 below. Applicants and EAPs are advised to consult the GIS database that forms part of this EMF to ensure that all the relevant environmental attributes are identified for the project location and that the most accurate and up-to-date information is being consulted. Specialist studies would always be required for “ground truthing” purposes in respect of any listed activities. Such ground truthing would also be valuable in determining the extent of the impact assessment required. The management framework for this EMZ can be found in Table 13 below.

EMZ - Industrial / Mining



| | | | | |
|--|--|---------------------------------|---|--|
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| | Scale: Kilometers | | | |

MAP 22: EMZ – Industrial/ Mining

| INDUSTRIAL/MINING ACTIVITY ZONE | | |
|--|---|--|
| ZONE AIM | MANAGEMENT OBJECTIVES | DESIRED OUTCOME |
| <ul style="list-style-type: none"> Promotion of industrial development in areas that are less vulnerable to change to ensure sustainable economic development. | <ul style="list-style-type: none"> Promote industrial development. Promote sustainable economic growth Reduce requirements for undertaking development. | <ul style="list-style-type: none"> Expansion of the industrial area |
| LIMIT OF ACCEPTABLE CHANGE | OPPORTUNITY FOR BENEFIT | MITIGATION/MANAGEMENT APPROACH |
| <ul style="list-style-type: none"> Industrial development may occur to a point where there is minimal effect on biodiversity. A degree of habitat loss may occur in these areas if the development remains within the designated zone. Development to not hamper the ecological functioning of surrounding terrestrial and ecological ecosystems | <ul style="list-style-type: none"> The potential for community development and stakeholder partnerships to ensure economic development that benefits all. The opportunity for job creation to reduce poverty and improve standards of living. Increased GDP and economic growth in a sustainable manner. | <ul style="list-style-type: none"> Development should be sustainable considering the sensitivity of the biodiversity in the area while ensuring maximum benefits. If the loss of important habitats is inevitable, rehabilitation and restoration strategies should be devised in offset receiving areas. Development must be restricted to already disturbed areas where possible. |
| APPROPRIATENESS MATRIX | | |
| COMPATIBLE LAND USE | | |
| <ul style="list-style-type: none"> Industrial (e.g. manufacturing infrastructure development, power generation, transport infrastructure). Industrial developments. Ecological infrastructure projects. Mining. Utilities. Energy generation. | | |

Table 12: Management Framework for EMZ 6-Industrial/ mining Activity Zone

8.3.5 Urban Development Zone

The purpose of establishing an urban development zone was to promote sustainable development within areas less vulnerable to urban development while decreasing urbanisation and urban sprawl. The selection of areas that are of less ecological importance, allows for the conservation of biodiversity and resources in areas more vulnerable to urban development.

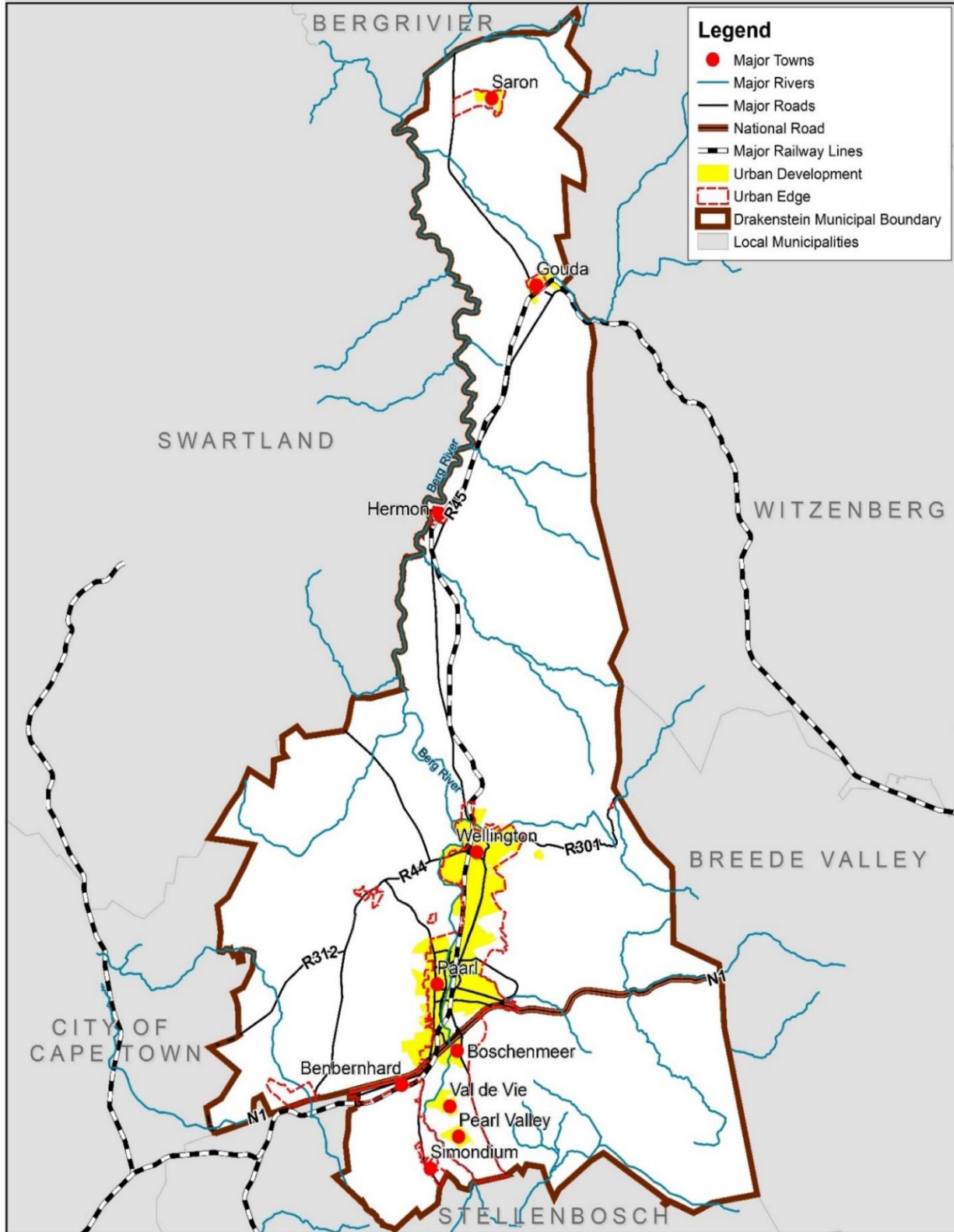
| EMZ 7: URBAN DEVELOPMENT ZONE / SPC: URBAN DEVELOPMENT | | |
|--|---|---|
| ATTRIBUTE | RATIONALE | COMMENTS/NOTES |
| <ul style="list-style-type: none"> Urban Areas (as derived from the Local SDFs) | <ul style="list-style-type: none"> Urban areas that have been identified in the local SDFs provide opportunity for sustainable urban development. Contain the footprint of the town within the current urban edge. | <ul style="list-style-type: none"> The establishment of an urban edge will promote the use of vacant land within the urban edge over that of land outside of the urban edge. |
| <ul style="list-style-type: none"> Urban infill /Densification Zone | <ul style="list-style-type: none"> Focus on infill and densification at strategic sites, as indicated on the Conceptual and Framework Maps Promote urban infill and densification at appropriate locations. Ensure that the densification takes place at significant nodes which have been identified. | <ul style="list-style-type: none"> Provide alternative housing options that are sustainable and eco-friendly. Promote infill development strategies and green architecture. Promote better housing typologies and layouts that provide quality spaces for social integration and economic opportunities. |
| | <ul style="list-style-type: none"> Promote infill development in the south of the Focus Areas. Densification is also proposed through development of formal densification zones in the north and south of the CBD, and towards the north of the Focus Area. | <ul style="list-style-type: none"> Management measures that maintain or enhance the sense of place must be implemented. The use of open space and green infrastructure must be considered to avoid wall-to-wall development. |

| | | |
|--|---|---|
| | <ul style="list-style-type: none"> • Support inclusive high-density infill development on vacant land within Paarl East. Support infill development on privately-owned land, which will enhance compaction and densification. • High-density residential developments should be encouraged through infill and densification, as earmarked on appropriate locations on the Conceptual Map • Promote appropriate and sensitive intensification and densification along identified Community Spines. • Promote infill development and densification on undeveloped and underutilised land within the urban edge. | <ul style="list-style-type: none"> • Development proposals must incorporate measures to adapt to climate change pressures for the region. Energy efficiency and water wise designs must also be taken into consideration. • Ensure that all new developments include a 'range of elements' that contribute to a more sustainable and legible urban environment. |
|--|---|---|

Table 13: Attributes that inform Urban Development Zone

The attributes set out in the table above were used as an informant for the development of the Urban Development Zone, which is shown spatially on Map 23 below. The dataset used as an informant for the development of this EMZ was derived from the latest municipal SDF for current and future urban development planning. Applicants and EAPs are advised to consult the GIS database that forms part of this EMF to ensure that all the relevant environmental attributes are identified for the project location and that the most accurate and up-to-date information is being consulted. Specialist studies would always be required for “ground truthing” purposes in respect of any listed activities. Such ground truthing would also be valuable in determining the extent of the impact assessment required. The management framework for this EMZ can be found in Table 15 below.

EMZ - Urban Development



Legend

- Major Towns
- Major Rivers
- Major Roads
- National Road
- Major Railway Lines
- Urban Development
- Urban Edge
- ▭ Drakenstein Municipal Boundary
- ▭ Local Municipalities

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|--|--|---------------------------------|---|--|
| | Created By: DEA&DP (Spatial Information Management) | Drakenstein Municipality | Date : 08 Nov 2021 Scale : 1:400 000 | <p>DISCLAIMER Liability disclaimed. Use at own risk.</p> Western Cape Government Environmental Affairs & Development Partners |
| | Scale: 0 2 4 8 12 Kilometers | | | |

MAP 23: Urban Development/SPC: Urban Development

| URBAN DEVELOPMENT ZONE / SPC: URBAN DEVELOPMENT | | |
|---|---|---|
| ZONE AIM | MANAGEMENT OBJECTIVES | DESIRED OUTCOME |
| <ul style="list-style-type: none"> To promote sustainable urban development. | <ul style="list-style-type: none"> The promotion of urban development in areas of less sensitivity The development of an urban edge. Reduce requirements for undertaking development | <ul style="list-style-type: none"> The consolidation of urban development in a sustainable manner. The regulation of various land uses within an urban area. The protection and incorporation of green infrastructure within urban areas, such as bioswales, urban parks, and novel ecosystems that provide services to residents within an urban area. |
| LIMIT OF ACCEPTABLE CHANGE | OPPORTUNITY FOR BENEFIT | MITIGATION/MANAGEMENT APPROACH |
| <ul style="list-style-type: none"> Urban consolidation and densification that leaves vital ecological infrastructure intact and operational. A degree of habitat loss may occur in these areas if the development remains within the designated zone. | <ul style="list-style-type: none"> The potential for increased service delivery through service infrastructure development. Reducing the demand for urban development in areas of greater ecological importance OR areas that are more vulnerable to urban development. | <ul style="list-style-type: none"> Urban development in vulnerable areas outside the urban edge should be avoided. The impact of development on important urban ecology should be avoided and minimised. Where the important urban ecology cannot be avoided and the impact is significant after minimisation and mitigation, offsetting the impact may be acceptable to the Competent Authority. |

| APPROPRIATE MATRIX |
|--|
| COMPATIBLE LAND USE |
| <ul style="list-style-type: none"> • Development proposals that are in keeping with the sense of place. • Densification of already transformed areas. • Proposals that integrate ecological infrastructure and open spaces. |

Table 14: Management Framework for Urban Development Zone/ SPC: Urban Development

8.4 Spatial Focus Areas

As indicated in section 8 the purpose of the is to provide broad guidance for land use, and environmental, decision-making across the jurisdiction of the municipality. However, the desired spatial vision may vary in relation to the particular needs across the spatial focus areas. Therefore, this section sets out the spatial development framework for the future growth of the Drakenstein Municipality per Spatial Focus Area in order to enable integrated spatial planning. The Municipal Spatial Development Framework illustrates the main development proposals on a municipal scale. It sets out the hierarchy of nodes and the delineation of the urban edges of these nodes.

The development proposals for the land outside of the urban edges are informed by environmentally sensitive zones, heritage areas, agricultural zones, scenic routes, and tourism routes. The Spatial Priority Areas are focused on the existing urban areas of Drakenstein Municipality and are therefore confined by the urban edge. Below are the Spatial Focus Areas that have been developed for each town of the Drakenstein Municipality.

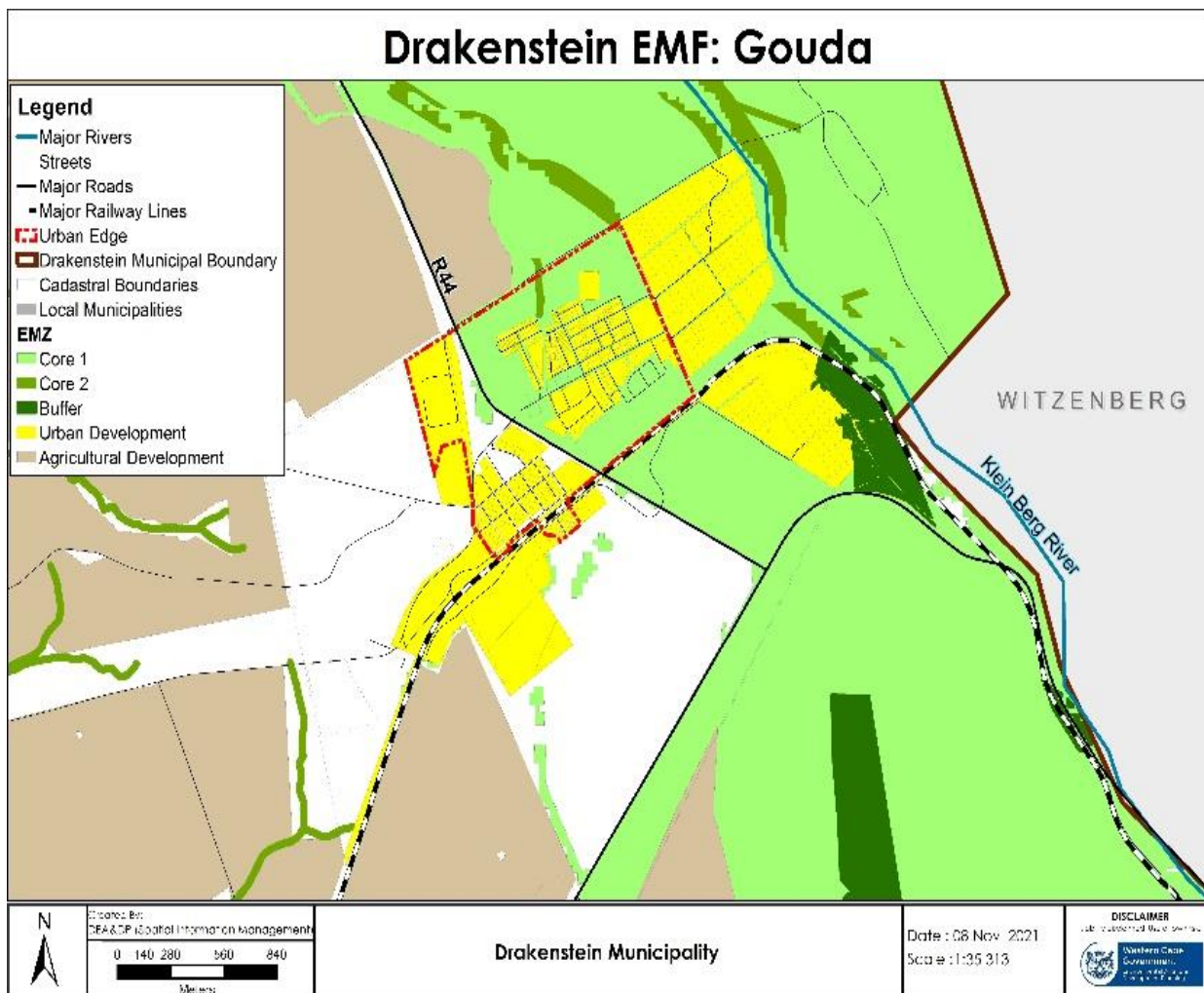
- Spatial Focus Area: Gouda
- Spatial Focus Area: Hermon
- Spatial Focus Area: Mbekweni
- Spatial Focus Area: Saron
- Spatial Focus Area: Windmeul
- Spatial Focus Area: Wellington
- Spatial Focus Area: Paarl
- Spatial Focus Area: Simondium

Therefore, it is also important to note that the Spatial Focus Area concept maps, and their associated map elements or focus area framework elements are meant as a conceptual guideline for high-level decision-making and does not replace the need to conduct detailed site-specific investigations prior to development decision-making.

8.4.1 Spatial Focus Area: Gouda

Gouda is predominantly a residential rural town, established in support of the agricultural activities in the surrounding area. The town is strategically- located at the intersection of the R46 to Tulbagh and the R44 to Saron and Porterville. The town is split by the R44 road. Due to its strategic location,

the town has, in the past, attracted some economic activity through agri-processing activities. The development focus of the FA should be to capitalise on its location on the R45/R44, and to focus investment on the town to become an important logistical/freight and agri-processing hub, as proposed in the Cape Winelands Rural Development Plan (Draft 2018/2019). The area is estimated to grow with an estimated 350 people (or 251 households) over the next 20 years (2020 to 2040).

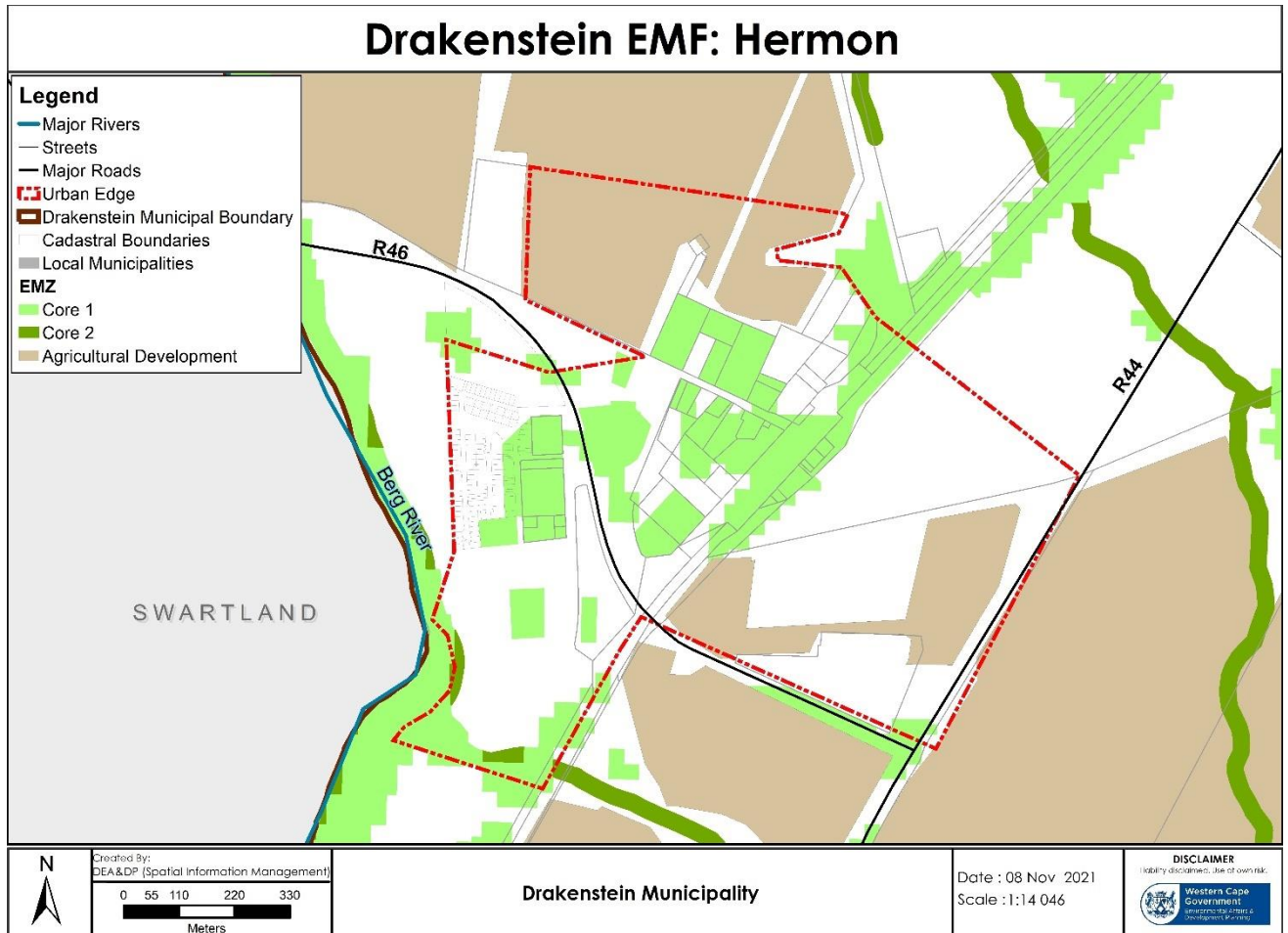


MAP 24: Spatial Focus Area: Gouda

8.4.2 Spatial Focus Area: Hermon

Hermon is situated at the intersection of the R44 and R46 to Riebeeck Kasteel. This FA is a rural node, with a limited economic base. The FA offers limited local/basic services to surrounding areas and to the surrounding farming community. The development focus for the FA should be to contain and enhance its rural character, to maintain its distinct sense of place of the town and to protect its heritage resources (the town used to be a mission station named Rondeheuvel). Due to its strategic location, the town can potentially attract businesses and industries that are interested in

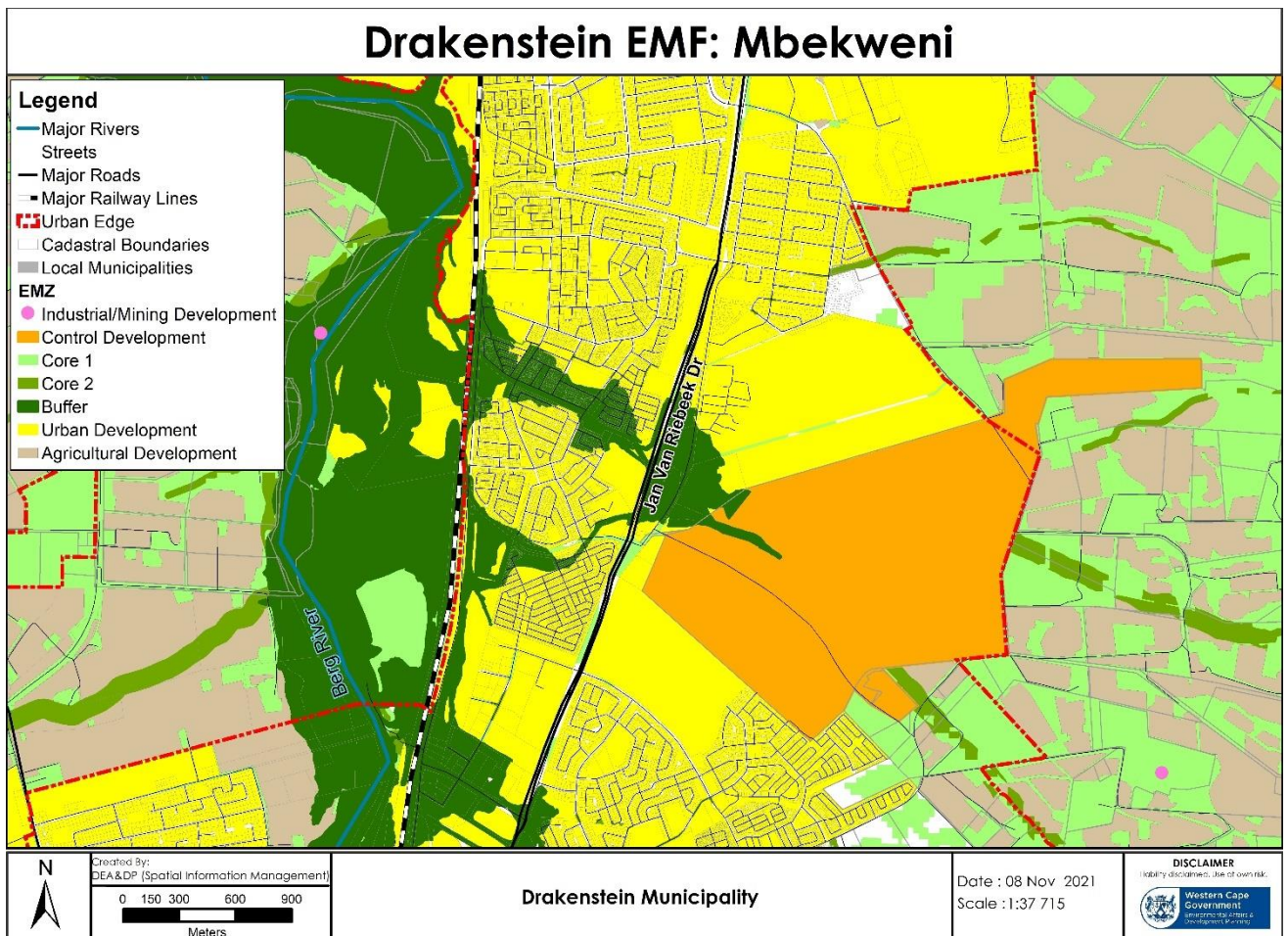
alternative technologies. The area is estimated to grow with an estimated 82 people (or 59 households) over the next 20 years (2020 to 2040).



MAP 25: Spatial Focus Area: Hermon

8.4.3 Spatial Focus Area: Mbekweni

Mbekweni is a high-density residential township. The town contains a mix of residential, commercial, and public facilities. Together with Wellington, Mbekweni is regarded as a secondary growth node, with development focused on creating an efficient and legible urban structure and improved linkages to surrounding urban areas through Non- Motorized Transportation (NMT) and Transit- Oriented Development (TOD) at strategic nodes. It is estimated that the area will grow with an estimated 13 523 people (or 5 735 households) over the next 20 years (2020 to 2040).

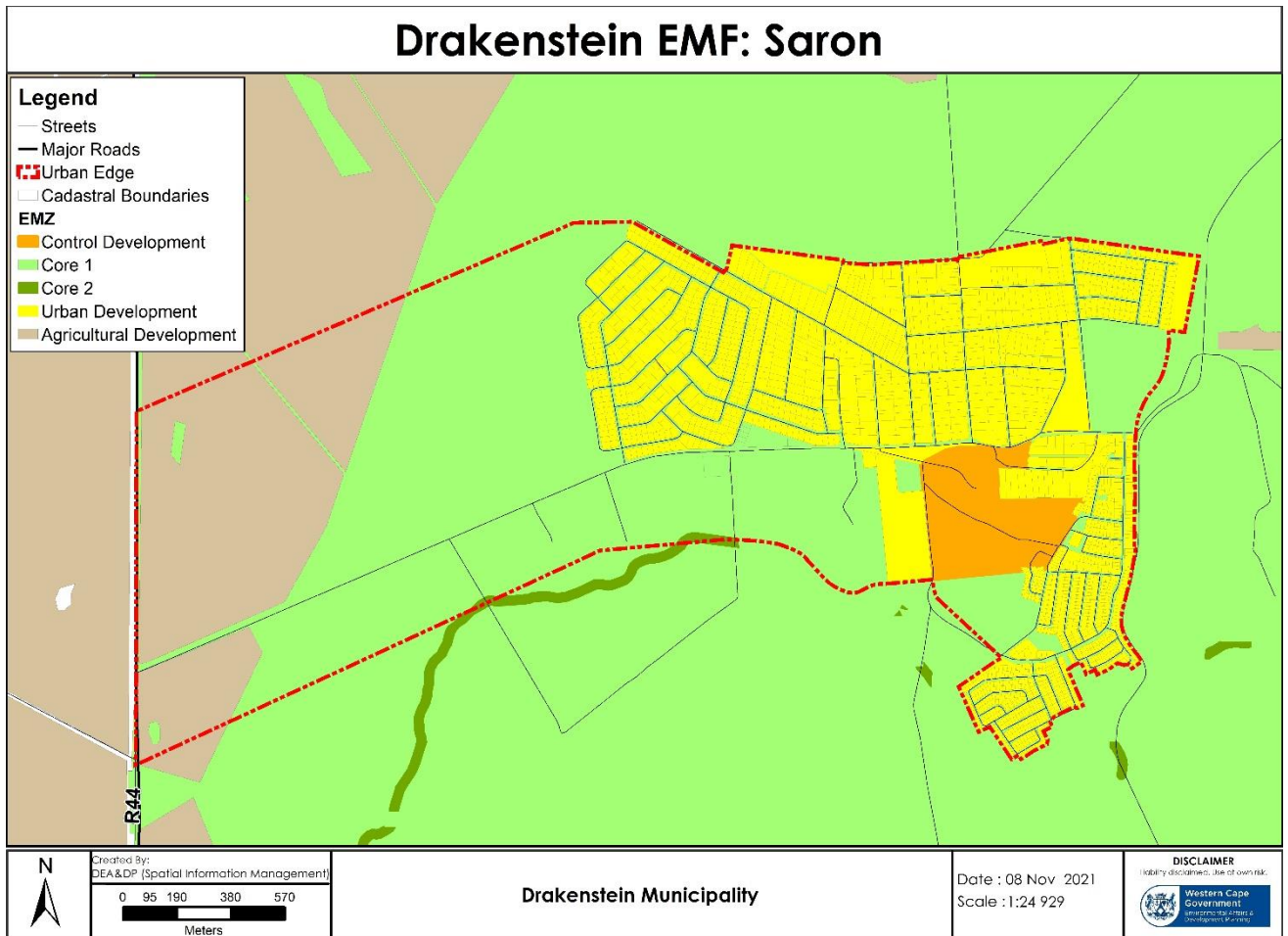


MAP 26: Spatial Focus Area: Mbekweni

8.4.4 Spatial Focus Area: Saron

Saron is historically a coloured settlement area, situated at the foot of the Saron Mountains. The town has several key historic buildings and a unique scenic rural landscape. The physical centre of the town is the historic core of the town, where several historically significant buildings and sites are located. A holiday resort with accommodation facilities, is located south of the main entrance road. The key development focus of the town should be on the preservation of its heritage and cultural resources, its pattern of development and preservation of its scenic rural landscape. Further development focus should be on skills development for residents, while future urban growth of the FA should be contained within the current urban footprint through infill and densification. The FA is currently the subject of a land claim, which is expected to take a substantial number of years to resolve.

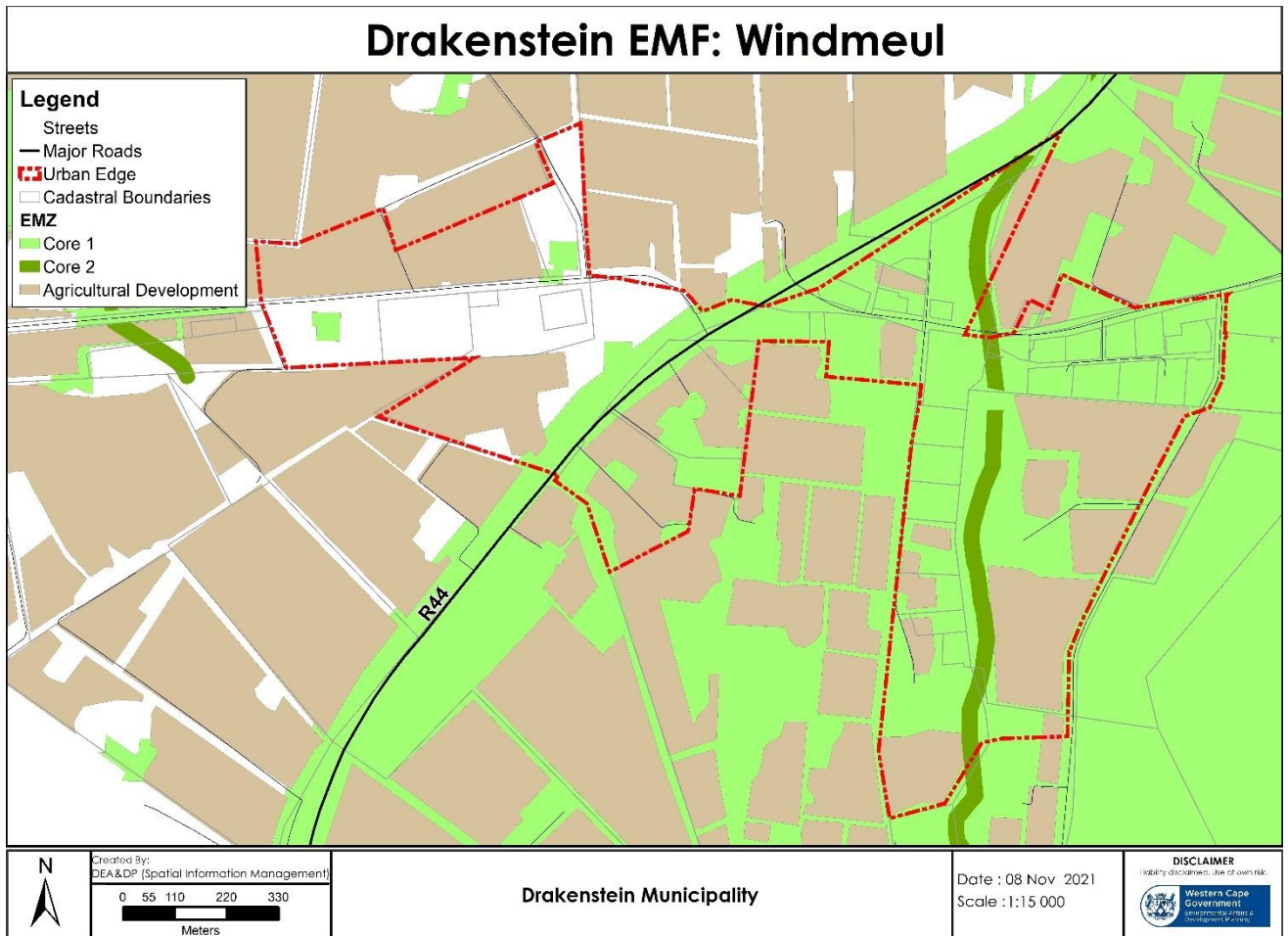
According to the Cape Winelands District Municipality Rural Development Plan (2017), Saron has been identified for the proposed implementation of a local-scale Farmer Production Support Unit (FPSU). Where relevant, investment planning to support the establishment of a FPSU should be aligned. The FPSU is a rural outreach unit connected with the proposed agri-hub planned in Ceres. The FPSU does primary collection, some storage, processing for the local market, as well as extension services including mechanisation. It is estimated that the area will grow with 903 people (or 647 households) over the next 20 years (2020 to 2040).



MAP 27: Spatial Focus Area: Saron

8.4.5 Spatial Focus Area: Windmeul

Windmeul is a small hamlet, strategically- located at the intersection of the R44 and MR281 roads. The settlement serves as a rural service centre for the surrounding intensive farming areas, where the produce is mainly wine and table grapes. There have been some development pressures for high-income residential development in the past, due to its strategic location on the R44 and its scenic landscapes. However, the lack of existing bulk water and sewerage infrastructure has prohibited future development of this area. The expansion of the node with off-grid residential development is, however, allowed, given that it is sensitive to the context of the current urban environment and enhances the local sense of place. Development focus for the FA should be to contain and enhance the rural character, maintain the distinct sense of place of the town, and to protect its heritage resources.



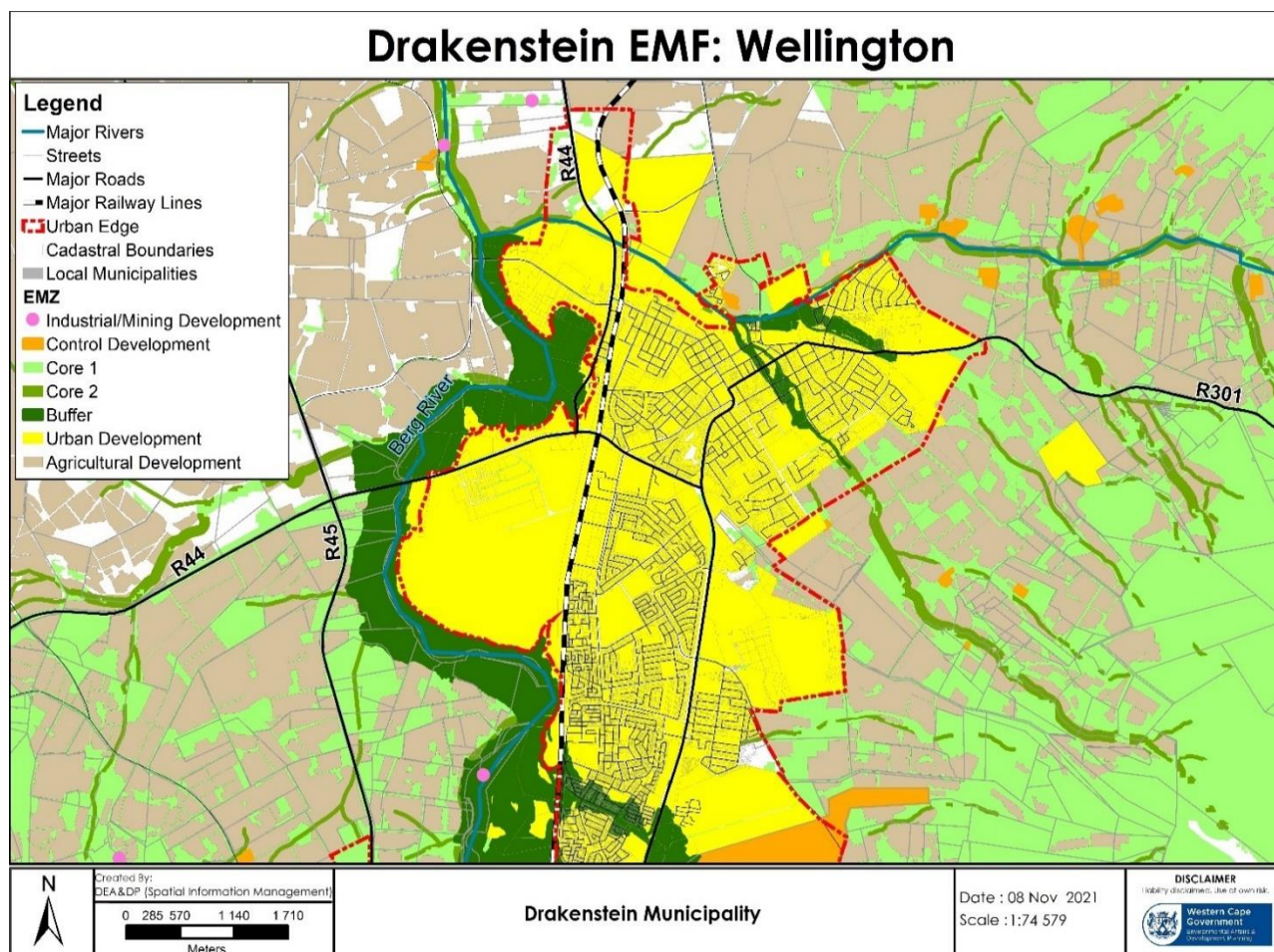
MAP 28: Spatial Focus Area: Windmeul

8.4.6 Spatial Focus Area: Wellington

Wellington is classified as a secondary growth node/secondary service centre. It is the second most significant settlement within the Drakenstein Municipality, after Paarl. It is considered an important urban settlement within the Drakenstein Municipality. According to the Growth Potential Study of Towns in the Western Cape (WCG, 2013), Wellington has a very high socio-economic need and, in tandem with Paarl, is classified as a regional node that fulfils services such as: tertiary education, agri-processing and distribution, tourism, and an administrative centre function for the northern Winelands Region. Wellington fulfils an important role in the region, from an economic, educational, agricultural, transport and industrial viewpoint.

This FA provides important health, education, cultural/heritage facilities, as well as government services. It acts as a service centre to the smaller rural settlements located within the Rural Hinterland. It is regarded as an important node, with a focus on development densification, agri-processing, and education. The development focus of this FA, for major development, is centred around areas that do not infringe on natural and cultural assets, where infrastructure is available and where movement networks can support future growth. This entails focusing on connecting with other main urban areas, such as Mbekweni and Paarl. The development focus of this FA, for major development, is centered around areas that do not infringe on natural and cultural assets, where

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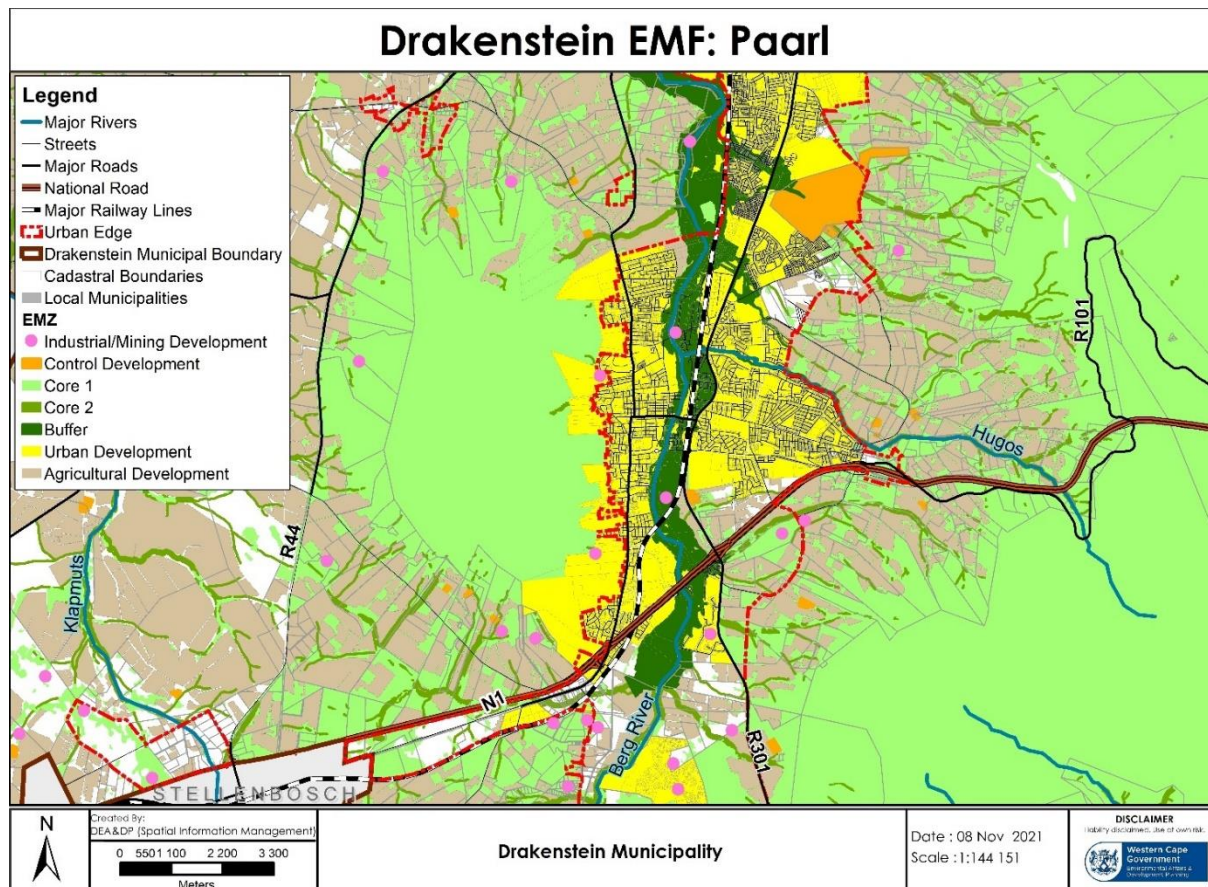
MAP 29: Spatial Focus Area: Wellington

The upgrade of the Wellington CBD, expansion of Wellington Industrial Park, enhancement of the town as an education precinct, and the protection of scenic landscapes and heritage resources, are all considered as important in the development focus for this FA. Wellington is considered to have medium to high growth potential, according to the Public Spatial Development Framework (PSDF) (2014), and there is potential for growth in this FA. The focus is, however, shifted towards infill development, densification, and the containment of the urban footprint of this FA. The area is estimated to grow with an estimated 24 190 people (or 10 259 households) over the next 20 years (2020 to 2040).

8.4.7 Spatial Focus Area: Paarl

Paarl is the main urban area and economic hub of the Municipal area, and is the centre where the main health, education, cultural facilities, and government services are located. It contains a variety of commercial/business services, as well as a strong education, health, industrial services, and agricultural sector. Paarl fulfils an important function as a regional centre within the greater Cape Metro Region. Paarl is the main regional centre, and the most significant urban settlement, within the Drakenstein Municipality. According to the Provincial SDF (2014), Paarl is classified as a high

growth potential area. The future growth of this FA is centered around economic development and residential densification to become a vibrant area where there is a high mix of different land uses such as residential, commercial, office and public amenities.

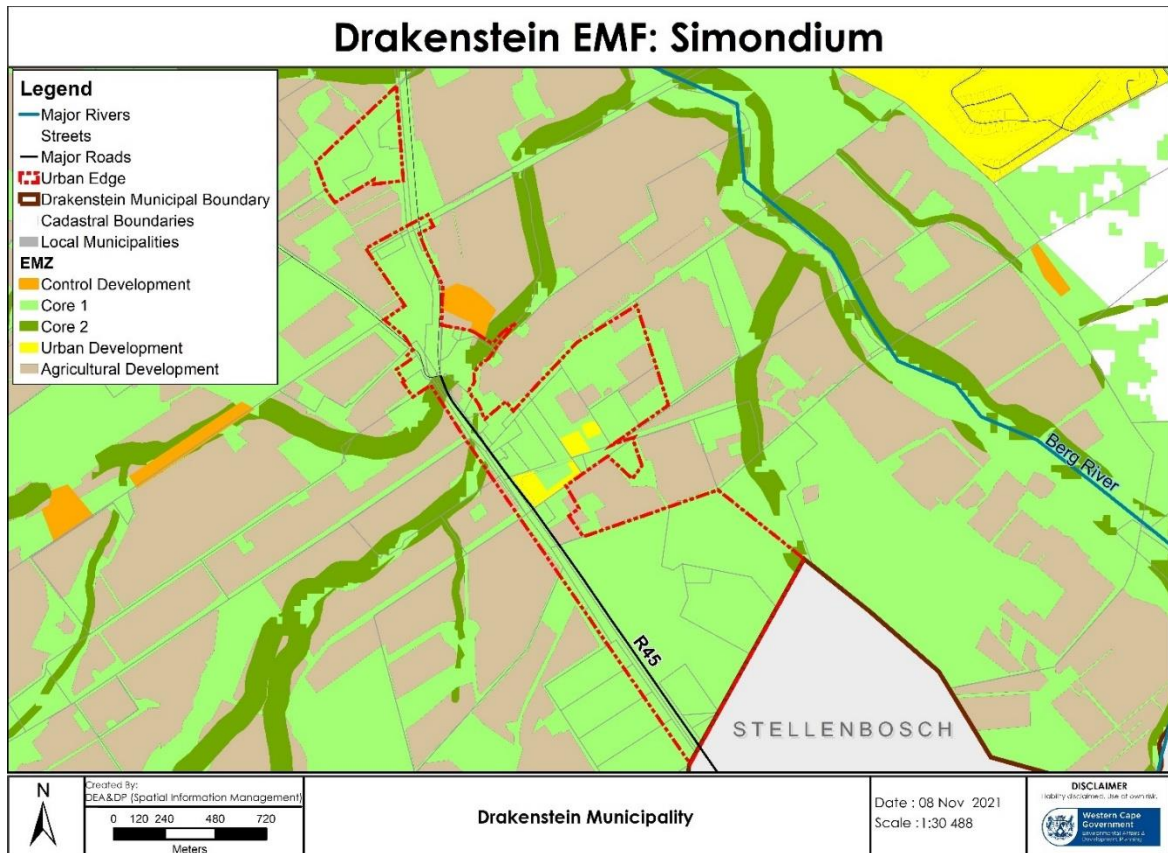


MAP 30: Spatial Focus Area: Paarl

The main focus for this area is to integrate Paarl West and Paarl East through NMT and TOD. Furthermore, focus is placed on the regeneration, renewal and densification of the Paarl CBD and strategic precincts, including Huguenot Station, Lady Grey, De Poort and Paarl Hamlet, through the implementation of projects that are highlighted in key interventions (Big Moves). The protection of heritage resources, valuable agricultural land, CBAs, the Berg River, and scenic landscapes, is important to ensure protection of the natural and built environments. Also included in the focus for this FA, is the upgrading and transformation of brownfield and existing industrial areas within Paarl, to transform the FA into a strategic logistical/transport hub, due to its strategic location and the existing infrastructure. The Paarl area constitutes the largest urban area within the Municipality, and houses more than 40% of its total population. The area is estimated to grow from 128 472 people in 2020, to 175 436 in 2040.

8.4.8 Spatial Focus Area: Simondium

Simondium is historically a Coloured rural and farm area. Simondium has a semi-rural character, and can be described as a rural precinct, located towards the southern edge of the Drakenstein Municipality. Currently, Simondium fulfils the role of a rural node. The area experiences pressure for non-agricultural use on agricultural land and there is a demand for farmworker housing. There is potential to develop along the R45, but this will have to be carefully managed and should be focused on urban development on a very small scale. This FA has tourism potential and can potentially become a social node and tourism gateway to the rest of the area.



MAP 31: Spatial Focus Area: Simondium

The development focus for the FA should, however, be on maintaining its natural, scenic, and agricultural assets by following the example that was set in the Boschendal model (Stellenbosch Municipality). This model called for setting back urban development from scenic routes and implemented a wide buffer of cultivated land between the road and the development. This allowed for contained nodal development on one side of the road. The area is estimated to grow with an estimated 104 people (or 74 households) over the next 20 years (2020 to 2040). It is important to note that the population growth estimates for Simondium does not take growth because of planned human settlement projects into account. Several human settlement projects have been planned for the Simondium FA.

9. GENERAL GUIDANCE FOR EIA PROCESS

This section provides guidance on the use of the EMF in respect of the EIA Regulations as well as for the use of the EMF when undertaking an application for environmental authorisation. It is not intended to provide detailed guidelines for the undertaking of EIAs. Rather this section deals with the way the EMF should be used in the EIA process.

9.1 Use of the EMF

The EMF should be used as follows:

- As a **screening tool** to evaluate whether the proposed location for a project is appropriate or not. This should be done through consulting both the EMF document and the associated GIS database. “Groundtruthing” would be of assistance in this regard. Where more than one location is under consideration, the EMF could be used to establish which option would be the most suitable. Furthermore, the EMF could be consulted prior to acquiring land (e.g., prior to purchase), as part of the process of assessing its suitability for a particular use, purpose, or project.
- As a **scoping tool** to identify the issues that require investigation as part of the EIA process. Each attribute that is indicated as being present at a particular location and its surroundings would need to be considered and relevant specialist input obtained. Note that a site should not be viewed in isolation since impacts can extend beyond cadastral or property boundaries. Thus, attributes within close proximity to the proposed development location must also be considered. This would be particularly relevant where a proposed development will rely on resources outside of its boundaries or where it would result in the discharge of emissions, effluent, or wastes. The use of the EMF to assist scoping should involve reference to both the EMF document and the associated GIS database. “Groundtruthing” would be of assistance in this regard.
- As an **impact assessment tool**, particularly in respect of determination of the acceptability of impacts. The tables that provide the management framework for each environmental attribute are applicable in this regard. Acceptability of impacts should be tested against the objectives, desired outcomes and limits of acceptable change described in these tables.

The earlier the EMF is consulted in the project planning and design process, the greater the potential for formulating a development proposal that is appropriate and that meets important sustainability criteria. Identifying issues that may be ‘showstoppers’ at an early stage is invaluable. These would be those issues that have significant potential for the rejection of the proposed development by I&APs and/or that have a high risk of having environmental authorisation refused. The EMF would also serve to identify issues that represent ‘red flags’. These would be those issues that need to be addressed to ensure the proposed development is appropriate. Such issues require investigation,

and the development would need to be responsive to the findings of the resultant studies. The more the development proposal responds to the sensitivity of environmental attributes (e.g., through avoiding adverse impacts), the greater the potential for it to be accepted and to make a positive environmental and social contribution.

9.2 Relevant legislation and guidelines

There is various legislation that needs to be considered when undertaking an environmental application. In addition, environmental and land use authorities or agencies may have published guidelines that need to be considered. Authorities and environmental organisations should always be consulted to determine the availability of guidelines: There may also be useful guidelines available through professional organisations.

9.2.1 Legislation

Legislation that may be relevant to an environmental application is shown in the table below. This table summarises key information in respect of national legislation. There may be applicable provincial and local legislation that also requires consideration. In particular, municipalities may have legislation that relates to effluent discharge, water conservation and fire and safety requirements. It is the responsibility of the applicant/proponent and the EAP to ascertain which legislation needs to be considered in the planning and design of the project and in the assessment of impacts.

| LEGISLATION | RELEVANCE |
|--|--|
| National Environmental Management Act (Act 107 of 1998) read with the EIA Regulations (GNR 327, 325, 324 of 7 April 2017) as amended. | <ul style="list-style-type: none"> • Principles (section 2) – these are relevant to developing assessment criteria. • Integrated Environmental Management objectives (NEMA - section 23) • EIA requirements (NEMA - section 24) |
| National Environmental Management Air Quality Act (Act 39 of 2004) read with: <ul style="list-style-type: none"> • Listed of Activities (GNR 893 of 22 November 2013) • Regulations regarding air dispersion modelling (GNR 533 of 11 July 2014) | <ul style="list-style-type: none"> • Projects that result in atmospheric emissions: <ul style="list-style-type: none"> • Establish need for an Atmospheric Emission Licence (AEL) • Emission standards to inform project design • Requirements for dispersion modelling within air pollution/quality specialist study |
| National Environmental Management Biodiversity Act (Act 10 of 2004) and: <ul style="list-style-type: none"> • Alien and invasive species regulations (GNR 598 of 1 August 2014) | <ul style="list-style-type: none"> • Projects located on vacant/undisturbed/undeveloped land • Alien clearing and rehabilitation requirements for land where alien species are present • Establish need for permit – restricted activities. |

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| <ul style="list-style-type: none"> • National list of ecosystems that are threatened and in need of protection (GNR 1002 of 11 December 2011) • Critically Endangered, Endangered Vulnerable and Protected Species List (GNR 1187 of 14 December 2007). | <ul style="list-style-type: none"> • Establish presence of listed species and/or listed ecosystems • Establish need for permit – restricted activities |
|---|--|

| LEGISLATION | RELEVANCE |
|--|--|
| <p>National Environmental Management Waste Act (Act 59 of 2008) read with:</p> <ul style="list-style-type: none"> • Listed Waste Activities (GNR 921 of 29 November 2013) • Norms and Standards for disposal of waste to landfill (GNR 636 of 23 August 2013) • National Norms and Standards for storage of waste (GNR 922 of 29 November 2013) | <ul style="list-style-type: none"> • Projects that involve waste facilities: <ul style="list-style-type: none"> • Establish need for a waste licence • Design of waste disposal facilities • Design of waste storage facilities |
| <p>National Water Act (Act 36 of 1998)</p> <p>General Authorisation (GNR 665 of 6 September 2013)</p> | <ul style="list-style-type: none"> • Projects that involve abstraction of water or discharge of effluent or stormwater into water resources. <ul style="list-style-type: none"> • Establish need for water use licence. • Establish water quality requirements. |
| <p>National Heritage Resources Act (Act 15 of 1999)</p> | <ul style="list-style-type: none"> • Any project that could affect heritage resources. Of particular relevance is: <ul style="list-style-type: none"> • Establish need for a permit (e.g., section 27) • Establish need for permission to alter buildings older than 60 years. • Establish need for Heritage Impact Assessment (section 38) |
| <p>Major Hazard Installation Regulations (GNR 692 of 2001) read with the General Machinery Regulations (GNR R1521 of 5 August 1988)</p> | <ul style="list-style-type: none"> • Project that involves the handling, storage and/or use of substances that could pose a major hazard <ul style="list-style-type: none"> • Establish need for Major Hazard Installation risk assessment and procedures for undertaking such assessment. • Notification of Major Hazard Installation. |
| <p>Hazardous Chemical Substances Regulations (GNR 1179 of 25 August 1995)</p> | <ul style="list-style-type: none"> • Establish design requirements for facilities involving handling storage and use of hazardous substances. |

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| General Safety Regulations (GNR 1031 of 30 May 1986) | <ul style="list-style-type: none"> Establish design requirements for facilities involving handling storage and use of hazardous substances. |
| Western Cape Biodiversity Act, 2021 (Act No.6 of 2021) (WCBA) | Section 37(2) of the WCBA states that, the Biodiversity Spatial Plan must inform— (a) the Provincial Protected Area Expansion Strategy and biodiversity stewardship; (b) the identification of ecosystems and ecological infrastructure and the listing of species in terms of this Act and other environmental legislation; (c) land use planning and decision-making; (d) policies and guidelines developed in terms of environmental legislation; (e) any decision-support system, environmental management instrument or strategic environmental assessment developed or used in terms of environmental legislation; The Biodiversity Spatial Plan must therefore also be used in the development of EMFs. |

Table 15: Key relevant legislation

There are numerous guidelines that available to assist applicants and EAPs in addressing environmental issues and thresholds in project planning and design. A list of guidelines is given below – this list is not exhaustive.

- DWAF Water Quality Guidelines of 1996. These guidelines comprise several volumes relating to different water uses, with the objective of ensuring water resources remain fit for use.
- Western Cape Provincial Spatial Development Framework: Rural Land Use Planning and Management Guidelines, May 2009
- NFEPA: Management Guidelines for wetland and river FEPAs (Implementation Manual for FEPAs (Driver et al 2011).
- DWAF Minimum Requirements relating to waste management (4 volumes) of 1998.
- DEA&DP A Berg River Improvement Plan- 2012
- DEA&DP Guidelines for involving specialists in the EIA process. A series of documents make up these guidelines including heritage, economic and biodiversity specialists.
- DEA&DP EIA Guideline and Information Document Series March 2013.
- DEA&DP Guideline on Environmental Management Plans.
- DEA&DP Guideline for the Management of Development on Mountains, Hills, and Ridges in the Western Cape.
- DEA&DP Guideline on the Application of the EIA Regulations to Structures Associated with Communications.
- DEA&DP Guidelines for Golf Courses, Golf Estates, Polo Fields, and Polo Estates in the Western Cape.
- DEA&DP: Rural Land Use Planning & Management Guidelines (2009)
- DEA&DP Generic Environmental Best Management Practice Guideline for Aquaculture Development.
- DEA&DP Provincial Spatial Development Framework (2009 and 2014).

- DEA&DP A Guide to Reporting and Estimating Emissions.
- Department of Environmental Affairs (DEA) Integrated Environmental Management Information Series. This comprises a series of documents that deal with various aspects of the EIA process.
- DEA: South African Manual for Outdoor Advertising Control.
- CapeNature stewardship guidelines.
- Drakenstein River Management Plan Ninham Shand and Freshwater Consulting Group).
- Cape Winelands Biosphere Reserve SDP.
- SANS 241 – South African Drinking Water Standard.
- SANS 1929 – Ambient Air Quality – limits for common pollutants.
- SANBI: National Biodiversity Assessment, 2018.

10. ROLES AND RESPONSIBILITIES

The roles and responsibilities in respect of the EMF are concerned with its implementation. There are various parties that have a role to play in giving effect to the EMF. These are:

- The environmental decision-making authorities (competent authority in respect of environmental authorisations under section 24 of NEMA).
- Commenting authorities.
- Authorities responsible for natural resources management.
- Authorities responsible for spatial planning, development planning and land use.
- Environmental Assessment Practitioners.
- Applicants.
- Applicants. Interested and Affected Parties

The respective roles and responsibilities of the above-mentioned parties are shown in Table 19 below.

| ROLE | RESPONSIBILITY |
|---|---|
| DEA&DP, DFFE, and the Department of Mineral Resources – competent authority for issuing environmental authorisation⁶³ | <ul style="list-style-type: none"> • Take the EMF into account: Cognisance must be taken of the EMF when considering environmental applications in the area covered by the EMF. This is a requirement of regulation 2(1)(c) of the 2010 EMF Regulations and of section 24(3) of NEMA. • Measure performance: The competent authorities should include performance indicators in their Annual Performance Plans to track the extent to which environmental decisions are aligned / not aligned with the EMF. • Maintain the EMF: Ensure that the EMF is kept up to date in accordance with an appropriate review period schedule. In doing so, cognisance must be taken of policy and legal developments as well as information pertinent to environmental trends including (but not limited to) the provincial and municipal State of Environment Report / Environmental Outlook Report, water resource management plans, biodiversity plans, waste management plans and AQMPs. |
| DEA&DP (Directorate: Climate Change and Biodiversity) / CapeNature / SANBI | <ul style="list-style-type: none"> • Keep track of transformation of biodiversity: This applies in general and in particular to CBAs / Critical Ecological Support Areas (CESAs / FEPAs and listed threatened ecosystems. Monitoring of levels of illegal conversion of natural areas also needs to be monitored. • Monitor remaining areas of natural, indigenous vegetation: It is essential that remaining areas of natural vegetation are monitored |

⁶³ “**environmental authorisation**”, when used in Chapter 5 of NEMA, means the authorisation by a competent authority of a listed activity or specified activity in terms of this Act, and includes a similar authorisation contemplated in any Specific Environmental Management Acts (NEMPAA, NEMBA, NEM Air Quality Act, NEM Integrated Coastal Management Act, NEM Waste Act and National Water Act). That is, ‘environmental authorisations’ include emissions and waste licenses/ permits, in addition to EIA authorizations.

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| | <p>in relation to conservation targets and that a reliable record of areas formally protected for conservation is maintained.</p> <ul style="list-style-type: none"> • Revise biodiversity plans: It is important that any erosion of CBAs/CESAs/ FEPAs triggers a revision of associated biodiversity plans and re-assessment of areas needed to meet conservation targets. |
| <p>DEA&DP (Directorate: Spatial Planning)</p> | <ul style="list-style-type: none"> • Take the EMF into account: Although there is no specific regulatory obligation placed on this Directorate to consider the EMF in decision-making, it must be borne in mind that an obligation is placed on all organs of state to consider the NEMA principles in respect of any activity for which they are responsible, where the activity could have significant environmental consequences. Decisions that involve land use and spatial planning would fall into this category. The EMF has taken cognisance of the NEMA principles and thus provides a mechanism for the Directorate to meet this legal obligation. Similarly, the EMF offers support to the Directorate in giving effect to the Environmental Right in the Constitution. It also supports the realisation of the Provincial Government of the Western Cape’s strategic objective relating to the mainstreaming of sustainability into its activities. |
| <p>Municipalities</p> | <ul style="list-style-type: none"> • Take the EMF into account: Although there is no specific regulatory obligation placed on the municipality to consider the EMF in decision-making, it must be borne in mind that an obligation is placed on the municipality to consider the NEMA principles in any activity that could have significant environmental consequences. Decisions that involve land use and spatial planning would fall into this category. The EMF has taken cognisance of the NEMA principles and thus provides a mechanism for the municipality to meet this legal obligation. Similarly, the EMF offers support to the municipality in giving effect to the Environmental Right in the Constitution. Furthermore, the EMF would be of assistance to the municipality in drawing up comments on environmental applications in its role as a commenting authority. • Encompass the EMF into the SDF: It is preferable that the EMF serves as the “environmental layer” in the municipality’s SDF. The SDF needs to be informed by environmental factors and the EMF can fulfil this role. This would mean that the environmental and land use authorities would be working off the same information base. This in turn would advance co-operative governance. This is one of the objectives of EMFs (regulation 2(3)(c)). • Participation in the review and updating of the EMF: The EMF would require revision on a regular basis (Refer to Section 14). The municipality may initiate the revision of the EMF and/or participate in this process and make relevant information available such as the SoER / Environmental Outlook Report, IWMP and the AQMP to ensure that there is consistency and synergies between these different environmental management tools. |

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| <p>Other authorities</p> | <ul style="list-style-type: none"> • Take the EMF into account: Consider the EMF in decision-making as it is a requirement to consider the NEMA principles in any activity that could have significant environmental consequences. The EMF has taken cognisance of these principles and thus provides a mechanism for the authority concerned to meet this legal obligation. • Use the EMF for commenting purposes: Clearly, the comments from authorities would be made in the context of their role and mandate. The EMF should be considered in drawing up comments on environmental applications. In particular, the EMF could be of assistance to authorities in providing a context and framework for their comments. |
| <p>Environmental Assessment Practitioners and specialists</p> | <ul style="list-style-type: none"> • Take the EMF into account: Consider the EMF when conducting BA or S&EIR processes. The EMF serves as a guide for the location of development proposals. It also provides assistance in the identifying potentially significant impacts and risks upfront. In this regard, impacts should be evaluated within the context of the management objectives and the limits of acceptable change detailed in the EMF. The objective of this approach would be to determine whether impacts are within acceptable levels or not. Finally, the EMF provides an early indication of specialist studies that may be required. EAPs should bear in mind that the competent authority is obliged to consider the EMF in its decision-making process. Thus, if the EMF is not considered in a BA or S&EIR process, there is a high probability that these reports will be rejected. |

11. DECISION-MAKING FRAMEWORK

Concern regarding the mainstreaming of environmental considerations into development and investment decisions has been debated and expressed at an international level. Among others, this is evidenced by the nature of international discussions associated with climate change and biodiversity conventions. This is despite the commitment made by governments, including South Africa, to promote the integration of the principle of environmental protection into development decision-making, as set out in the Rio Declaration. In an analysis by the United Nations Development Programme, United Nations Environment Programme, World Bank, and the World Resources Institute⁵⁷ it is concluded that development decisions are being made without local information, consultation, or support. Accordingly, the contribution of ecosystem goods and services to human welfare is not **Table 16: Roles and responsibility in respect of the EMF** being adequately recognised, which leads to erosion of civil and economic rights, as well as natural heritage.

One of the reasons that this situation exists is that there is a “disconnect” between different levels of decision-making. There are basically two types or levels of decision-making: namely strategic decisions and implementation decisions, which are interdependent. Progress with mainstreaming

environmental considerations into development decisions has improved in the last decade in South Africa through the development of tools such as biodiversity plans and the prioritisation of freshwater resources.

In the context of determining how land should be used (i.e. development planning) strategic decisions, are primarily concerned with defining the direction over the long-term. Thus, a strategy would reflect the “desired future state” of an area or region, for example. **Strategic decisions** range from the adoption of international agreements, the formulation of national policies and plans (which become gazetted as White Papers) and the preparation of Spatial Planning Frameworks, such as the PSDF and Municipal SDFs. Similarly, an EMF can be regarded as a strategic-level document and its endorsement or adoption by the Minister or MEC responsible for environmental matters amounts to a strategic-level decision.

Implementation decisions relate specifically to the management or control of development on a particular site or area. Decisions at this level (site specific) ought to be aligned with the strategy for the area. If they are not, they have the potential to undermine the strategy and its vision and goals. This in turn means that it would be highly unlikely that the “desired future state” put forward in the strategy would be achieved. Thus, given that a sustainable future is generally acknowledged to be desirable, decisions about development and economic growth must be taken with sustainability principles in mind.

11.1 Decision-making (sustainability) criteria

Together, the Constitution and NEMA provide a robust foundation for sustainability that has guided the preparation of this EMF. Section 24 of the Constitution of South Africa, the ‘environmental right’, states that everyone has the right to an environment that is not harmful to health or wellbeing, and to have the environment protected for the benefit of present and future generations, through reasonable measures that:

- prevent pollution and ecological degradation
- promote conservation and
- secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

This section lays a foundation for long-term conservation or protection of important natural and social resources as envisaged by the environmental management principles in the NEMA. The NEMA principles underline the fact that the environment is ‘held in public trust’, to be safeguarded as ‘the people’s heritage’. These principles therefore acknowledge the dependence of human wellbeing on natural systems and resources. It is widely acknowledged that environmental concerns must be considered if basic human needs are to be met, both now and in the future. The NEMA principles emphasise conservation of biodiversity and ecological integrity (paying particular attention to sensitive, vulnerable, highly dynamic, or stressed ecosystems subject to development or use

pressure), conservation of heritage landscapes and sites, and avoiding or minimising and remedying pollution and environmental degradation.

In addition, a 'risk averse and cautious' approach is advocated, that considers limits of current knowledge about decisions and actions. Importantly, the principles include an expanded 'polluter pays' requirement, that requires Applicants to take account of the potential of their proposed project/development to cause adverse environmental impacts (e.g., pollution, environmental degradation, adverse human health effects) upfront. In effect, this means that the Applicant's project would carry the costs of avoiding negative environmental and social impacts, and where these cannot be fully avoided to minimise such impacts. This is in accordance with the mitigation hierarchy, which is encompassed in the NEMA principles. In circumstances where adverse impacts involve threatened resources (natural or social), impact mitigation might include compensation for or offsetting of the residual negative impact. In essence, this approach deals with equity and environmental justice concerns, preventing private enrichment at the cost of loss or deterioration in public resources.

Table 20 presents several broad sustainability criteria which should be used to guide decision-making on development within the Drakenstein Municipality. These criteria have been developed internationally and can be seen to resonate well with the requirements of both the Constitution and NEMA. In addition, they reflect the contents of the draft Municipal Decision-making Guideline prepared for DEA&DP.

| SUSTAINABILITY CRITERIA | | S24 OF THE CONSTITUTION | RELATED NEMA PRINCIPLES |
|-------------------------|--|--|--|
| 1 | <p>Integrity and resilience of social-ecological systems</p> <p>Maintain the long-term integrity of ecosystems and associated social systems.</p> <p>Protect the irreplaceable life-support functions and diversity of life (biodiversity) that provides future insurance against change, and on which human as well as ecological well-being depends, and maintain or improve the ability of the ecosystems and dependent social systems to recover after disturbance or shocks.</p> | <p>Everyone has the right to an environment that is not harmful to health or wellbeing, and to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development while promoting justifiable economic and social development.</p> | <p>s4(a) Sustainable development requires consideration of all relevant factors, including:</p> <p>(i) Avoid or, where not possible to altogether avoid, minimise & remedy, disturbance of ecosystems & loss of biological diversity;</p> <p>(ii) Avoid or, where not possible to altogether avoid, minimise & remedy pollution & degradation of the environment;</p> <p>(iii) Avoid or, where not possible to altogether avoid, minimise & remedy, disturbance of landscapes and sites that constitute the nation's cultural heritage.</p> <p>(r) Sensitive, vulnerable, highly dynamic, or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.</p> |
| 2 | <p>Social and livelihood sustainability</p> <p>Support and improve sufficient services, resources, and opportunities to contribute to sustainable livelihoods (e.g., access to basic resources and essential services, employment opportunities, reduced vulnerability to disease and economic insecurity, and opportunities to seek improvements in social, human, and productive capital in ways that do not compromise future generations).</p> | | <p>s2(2) Environmental management must place people and their needs at the forefront of its concern, and serve their long-term physical, psychological, developmental, cultural, and social interests equitably.</p> <p>s4(a)(v) Responsible and equitable use and exploitation of non-renewable natural resources, considering consequences of resource depletion.</p> <p>(vi) Development use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised.</p> <p>(q) Recognise the vital role of women and youth in environmental management and development, and promote their full participation</p> |
| 3 | <p>Equity and environmental justice within current generations</p> | | <p>s4(c) Pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly</p> |

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| | <p>Ensure fairness in allocation of, and access to, natural resources and opportunities in the Drakenstein municipal area, so that gaps in wellbeing between rich and poor in the current generation are narrowed.</p> | | <p>discriminate against any person, particularly vulnerable and disadvantaged persons.</p> <p>(d) Pursue equitable access to environmental resources, benefits, and services to meet basic human needs and ensure well-being. Special measures may be taken to ensure access by categories of persons disadvantaged by unfair discrimination.</p> <p>(p) The costs of remedying pollution, environmental degradation, and consequent adverse health effects and of preventing, controlling, or minimising further pollution, environmental damage or adverse health effects must be paid for by those responsible for harming the environment.</p> |
| 4 | <p>Equity and environmental justice between generations</p> <p>Ensure fairness in allocation of, and access to, natural resources and opportunities in the Drakenstein municipal area, so that options for future generations are kept open.</p> | | <p>s4(o)The environment is held in public trust for the people, the beneficial use of resources must serve the public interest and the environment must be protected as the people’s common heritage.</p> |

| SUSTAINABILITY CRITERIA | | S24 OF THE CONSTITUTION | RELATED NEMA PRINCIPLES |
|-------------------------|---|--|---|
| 5 | <p>Efficiency in use of natural resources and available capacity</p> <p>Ensure that no one would be left worse off, benefits are maximised, and costs are minimised, resources (e.g., water, energy) are used efficiently, and best use is made of available capacity.</p> | <p>Everyone has the right to an environment that is not harmful to health or wellbeing, and to have the environment protected for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development while promoting justifiable economic and social development.</p> | <p>s4(a)(v) Responsible and equitable use and exploitation of non-renewable natural resources, considering consequences of resource depletion.</p> <p>(vi) Development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised.</p> |
| 6 | <p>Democracy and good governance</p> <p>Promote good governance, appropriate and capacitated institutions, greater attention to fostering reciprocal awareness and collective responsibility.</p> | | <p>s4(f) Promote participation of all I&APs in environmental governance, and all people must have the opportunity to develop understanding, skills, and capacity necessary for achieving equitable and effective participation. Ensure participation by vulnerable and disadvantaged persons.</p> <p>(g) Decisions must consider the interests, needs and values of all I&APs, recognising all forms of knowledge including traditional and local knowledge.</p> <p>.... (h) Promote community well-being and empowerment through environmental education, raising environmental awareness, sharing of knowledge and experience and other appropriate means</p> <p>(k) Decisions must be taken in an open and transparent manner and access to information must be provided in accordance with the law.</p> <p>.... (l) There must be intergovernmental co-ordination and harmonisation of policies, legislation and actions relating to the environment.</p> |
| 7 | <p>Precaution and adaptation</p> <p>Respect uncertainty avoid even poorly understood risks of serious, irreversible damage to the foundations of sustainability, or irreplaceable loss</p> | | <p>s4(a)(vii) A risk-averse and cautious approach is applied, considering the limits of current knowledge about the consequences of decisions and actions (vii).</p> |

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|---|---|--|--|
| | of resources, plan to learn, design for surprise and manage for adaptation. | | |
| 8 | <p>Integration</p> <p>Seek mutually supportive benefits, synergies and overall gains or positive outcomes for all the above sustainability criteria and in integrating different land uses in the terrestrial and aquatic environment of the Drakenstein municipal area.</p> | | <p>s4(a)(viii) Anticipate and prevent negative impacts on the environment and on people’s environmental rights; where they cannot be altogether prevented, they should be minimised and remedied.</p> <p>(b) Environmental management must be integrated and consider effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.</p> |

Table 17: Linking the Sustainability Criteria proposed for use in the EMF to the Constitution of South Africa and the National Environmental Management Act (NEMA: Act 107 of 1998)

11.2 Using the EMF to inform environmental decision-making

The significance of impacts caused by development depends on:

- The nature of the proposed development (e.g., heavy industry is generally associated with high pollution potential and health hazard) and the extent to which potential impacts can be effectively mitigated; and
- The attributes of the receiving environment (e.g., scarce water resources, sensitive, vulnerable, or threatened ecosystems, fertile soil / productive agricultural area, sensitive cultural resources).

Where the characteristics and value of the receiving environment are unique or considered to be irreplaceable, almost any type of development would cause significant impacts. This situation is represented by the 'Keep Assets Intact' EMZ. Where the receiving environment is less sensitive in that there are important attributes, but these are not irreplaceable, the nature of the development would determine the significance of impacts. The 'Develop with Care' EMZ is of relevance to this situation.

The Drakenstein area has been extensively transformed in the past for a range of agricultural uses and settlement. Most of the areas that could support productive land uses have already been converted, and the ecosystem services underpinning those uses are reaching, have reached, or have exceeded their capacity to support further growth. Pressures on natural resources are illustrated by, for example, the deterioration in the quality of water in, and the condition of the Berg River.

Since this area has a high concentration of unique, threatened and/or highly valued natural and heritage resources, further transformation and use of resources outside existing urban areas must be approached with caution. In effect, the receiving environment dictates the type of development that could be supported. For this reason, all the areas beyond existing urban areas ('limited constraints zone') fall into either a 'Keep Assets Intact' or a 'Develop with Care' EMZ. The EMF provides clear management objectives and specifies limits of acceptable change for each EMZ. These considerations should be used by decision-makers to evaluate development proposals, and by developers to guide their proposals in such a way as to minimise risk.

In essence, further development of the Drakenstein should be '**smart growth**' rather than simply growth for its own sake, in response to the Municipality's values of 'sustainable' and 'quality' living environments. That is, the focus should be on advancing human wellbeing and quality of life through improving the efficiency and quality of - and increasing the spread of benefits from - existing agricultural and commercial activities, and on realising the opportunities for development associated with the unique natural and heritage assets of this Municipality.

Development proposals that would lead to environmental impacts inconsistent with the recommendations of the control zones and associated limits of acceptable change should not be authorised unless there are unique and/or exceptional circumstances. These 'exceptional circumstances' would be associated with over-riding public good issues such as meeting basic needs and the equitable distribution of resources. Projects involving public infrastructure developments where it can be demonstrated conclusively that there are no alternative locations for these projects, and no options exist for delivering the intended benefits to the public would fall into this category.

Where at all possible, development should strive to exploit opportunities to make a net positive contribution to the health of the environment and wellbeing of people in the Drakenstein municipal area as well as avoiding negative impacts.

The issues in the Drakenstein that are central to its sustainability are:

- Biodiversity conservation;
- Conservation and/or improvement of ecosystem services;
- Safeguarding productive agricultural land;
- Protecting cultural heritage and important social resources,
- Controlling urban spread; and
- Providing infrastructure and services in support of poor and vulnerable communities.

The tables relating to the EMZs provide criteria in the form of management objectives and Limits of Acceptable Change which should be applied in the environmental decision-making process. There is no uniform definition or description of a good environmental decision. Gibson *et al* (2005) note that decisions should be aimed at achieving net gains from a sustainable development perspective. In this regard, decision-making criteria need to be clarified and the trade-offs between criteria that are applied by decision-makers must be open. Generally, attributes of a good decision are considered to include the following:

- That it provides for protection of natural resources.
- That the social costs are not borne solely or primarily by vulnerable groups or communities.
- That it is in the interests of the “public good” particularly in respect of access to resources.
- That it does not result in Limits of Acceptable Change being exceeded.
- That it takes cognisance of the NEMA principles.
- That it is technically sound.
- That it is based on a defensible rationale.
- That it reduces risk at a reasonable cost.
- That it is consistent with other similar decisions.
- That it meets legal obligations or requirements.
- That it takes account of limitations in knowledge, adopting a precautionary approach where warranted.
- That it is based on input from all parties.
- That it addresses a clearly defined problem.
- That it provides a solution and does not transfer the problem from one place or time to another place or time.
- That it is widely accepted.

12. MONITORING AND EVALUATION FRAMEWORK

The EMF highlights particular environmental attributes and their limits of acceptable change in relation to specific management objectives. The EMF strives to instil a proactive approach to environmental management by directing development to areas that could support such development, thereby striving to avoid or prevent significant negative effects and optimise potential benefits. In addition, the EMF sets explicit objectives and limits of acceptable change for environmental attributes; the onus being on the proponent of development to demonstrate reliably that these limits would not be exceeded.

However, for the EMF to be effective, it is essential that these attributes be monitored and evaluated considering the objectives, and that negative trends are brought to the attention of the Municipality, other responsible authorities, and the public. Only in this way can decision makers take due notice of potential problem areas and build in relevant safeguards to halt negative trends.

The monitoring and evaluation of these attributes should be a focus of the SoER, of the Municipality's IWMP and AQMP, of relevant catchment management agency or water user associations and of monitoring in terms of biodiversity plans.

12.1 Indicators – delivering sustainability through the EMF

The purpose of the indicators is to provide a basis for measuring performance. In the case of the EMF, the indicators are focused on primarily on the EIA Regulations, with a view to assessing the performance of this system against policy goals and priorities and in relation to objectives and desired outcomes described in this EMF. Indicators are provided for:

Environmental authorisation compliance

- Green economy
- Biodiversity and ecological integrity
- Agricultural resources
- Water resources and water quality
- Heritage resources
- Environmental quality and risk

It is envisaged that these indicators would be incorporated into the performance management system of the DEA&DP in respect of its environmental impact management role. Other decision-making authorities could also utilise these indicators (e.g., land use and planning decision-makers). It is not the intention that all the indicators be applied as this would result in a potentially cumbersome performance monitoring system. Rather, a wide range and number of indicators are provided from which the most meaningful, useful, and appropriate would be selected.

12.1.1 Environmental authorisation compliance

- Number of incidents of non-compliance with conditions of environmental authorisation.
- Number of incidents of non-compliance with conditions of authorisation that have resulted in environmental pollution or degradation.

- Number of incidents of non-compliance with conditions of authorisation that have resulted in the reduction of or loss in extent of environmental resources.

12.1.2 Green economy

- The number and type of projects authorised which have resulted in job creation through community-based natural resource management and the number of jobs created.
- The number and type of projects authorised where green technology has been applied to reduce water use and the extent of water savings achieved.
- The number and type of projects authorised where green technology has been applied to reduce energy use and the extent of energy savings achieved.
- The number and type of projects authorised where green technology has been applied to reduce waste production and the extent of waste reduction achieved.
- The number and type of projects authorised where green technology has been applied to reduce pollution to air, water, or land.

12.1.3 Biodiversity and ecological integrity

- The number and type of projects that have been authorised which have resulted in loss or reduction in the area (ha) of CBAs, CESAs, FEPAs and important ecological corridors.
- The number and type of projects that have been authorised which have resulted in a reduction in the area of unique or special habitats.
- The number and type of projects that have been authorised which have resulted in a decline in the number of threatened or local endemic plant or animal populations.
- The number and type of projects authorised that have resulted in the loss or infilling of wetlands and the number of wetlands affected.
- The number and type of projects authorised that have resulted in land conversion (ha) within the prescribed buffer zones of river corridors and wetlands.
- The number and type of projects authorised where an area of land has been committed to formal conservation in terms of NEMPAA and/or set aside as a biodiversity offset.
- The number and type of projects authorised which have resulted in a reduction of the area (ha) of invasive alien plant cover (e.g., through clearing) and where this area is undergoing an ecological restoration process.
- The number and type of projects approved in which wetlands have been restored or created and the extent thereof (ha).
- The number and type of projects authorised which include riverine corridor restoration and the extent thereof (ha).

12.1.4 Agricultural resources

- The number and type of projects authorised which have resulted in the loss of irrigated agricultural land (ha).
- The number and type of projects authorised which have resulted in the loss of dryland agricultural land (ha).

12.1.5 Water quality and flow

- Number and type of projects authorised that require water abstraction from rivers or water bodies.
- Number and type of projects approved that require water abstraction to the extent that could threaten the maintenance of the ecological reserve or in-stream flow requirements in rivers.
- Number and type of projects authorised that will result in the release of effluent into rivers or water bodies.
- The number and type of projects authorised that result in changes to the floodlines, such that flooding risk has changed and whether this risk has increased or decreased.

12.1.6 Heritage resources

- Number and type of projects authorised which have resulted in the damaging or destruction of heritage resources.
- Number and type of projects authorised which have resulted in restoration and/or given formal protection.

12.1.7 Hazards

- Number and type of projects authorised which have a known nuisance or pose a hazard and are located next to sensitive land uses.

12.1.8 Environmental quality and risk

- Number and type of projects authorised which have a known nuisance or pose a hazard and are located next to sensitive land uses.
- Number and type of projects authorised that are located in risk areas such as flood prone areas.
- Number of inhabitants within the Drakenstein area.
- Number of households with access to toilets.
- Number of households with access to potable water.
- Type of dwelling occupied by inhabitants.
- Number of inhabitants per dwelling.
- Average household income.
- Number of household members employed including their gender and age.
- Number of household members at school, including an indication of the highest level of education for each household member.
- Average income per capita in the study domain
- Gini Coefficient for the study domain.

- Descriptive statistics of the economy of the Drakenstein area, including:
 - The areas GDP
 - The sectoral composition of the GDP
 - Trends within the economy.

12.2 Indicators – adherence to the EMF

- Number of applications authorised that meet the EMF management objectives relevant to the application.
- Type/nature of EMF objectives where difficulty is being experienced in meeting these.
- The number of applications where trade-offs have been applied in decision-making where the outcomes/objectives of the EMF are being met.
- The number of applications where trade-offs have been applied in decision-making where the outcomes/objectives of the EMF are being undermined.
- The nature of trade-offs that are being applied in decision-making – what is being traded off and why?

13. MAINTAINING THE EMF

This section deals with both the updating of the EMF and its integration with spatial plans.

13.1 Updating the EMF

The EMF must be updated every **five** years. It is preferable that the revision cycle be synchronised and integrated with the IDP/SDF revision. A protocol for revision is as follows:

1. The revision cycle would be initiated by the DEA&DP in consultation with the relevant municipality/ies.
2. The DEA&DP should inform the national DFFE of the EMF revision process.
3. The DEA&DP should inform other relevant national, provincial, and local authorities that the EMF is entering a revision cycle. These authorities can be requested to advise as to whether they have useful information to contribute.
4. Assess the performance of the EMF against the relevant indicators and determine where performance has been weak and where it has been satisfactory. In particular, consider whether the EMF has contributed to the reversal of negative trends and if so, how this was achieved. If the EMF is deemed to have resulted in a worsening of negative trends, then the reasons need to be established so that these weaknesses can be addressed in the revision process. The results of this performance assessment process should be used to inform the Scope of Work for the EMF revision/updating. It is preferable to involve other relevant authorities in the evaluation of performance of the EMF.
5. The revision process should involve the following:
 - Establish whether new or revised data with respect to environmental attributes are available. The GIS database and Situation Assessment must be updated accordingly.
 - Determine whether new or revised policies and/or guidelines relating to sustainability, heritage resources, biodiversity, water, and other natural resources management and/or environmental management have been published that are of relevance to the EMF area. Review the criteria relating to management objectives, desired outcomes, and limits of acceptable change in light of any new or revised policies/guidelines.
 - Evaluate whether the attribute criteria for the EMZs are still relevant and revise as necessary. Update the EMZ maps and the associated tables as relevant.
 - Determine whether trends and pressures identified in the EMF are still relevant, whether negative trends have worsened, stabilised, or reversed, and if there are any new trends emerging that pose challenges for environmental management, drawing in particular on SoER and/or Environmental Outlook reports. Review the categories of EMZ, and the criteria relating to management objectives, desired outcomes, and limits of acceptable change, as appropriate, to address these trends.

Integration with spatial plans the information base used to determine EMZs in this EMF comprises the best available, up to date data on a wide range of attributes. These EMZs should therefore inform the pattern and direction of future development and thus the decision-making process. Furthermore,

they should be used by the municipality to assist in defining an urban edge and giving environmental input into the SDF and zoning schemes.

Every municipality must adopt an IDP within a prescribed period after the start of its elected term.⁶⁴ An IDP adopted by the council of a municipality is “the principal strategic planning instrument which guides and informs all planning and development.”⁶⁵ The IDP must be “compatible with national and provincial development plans and planning requirements binding on the municipality in terms of legislation.”⁶⁶ In practice, there is likely to be an IDP already in place while the EMF is being drafted. Municipalities are required to review their IDPs annually.⁶⁷ At this stage, an EMF adopted during the previous year, must be considered, and may be integrated with the SDF.

EMFs could have legal effect through linking them to other development plans. These may include zoning schemes adopted under the Land Use Planning Ordinance;⁶⁸ IDPs (which municipalities must compile in terms of the MSA)⁶⁹ and the SDFs contained in IDPs.

The EMF highlights both opportunities and focal areas for directing future development, and constraints to development. These opportunities and constraints can only be translated into effect by informing and linking with the SDF, i.e., it is important for the SDF and EMF to ‘speak the same language’. The EMF ultimately needs to be embedded in the zoning scheme.

In the case of the Drakenstein Municipality EMF, the Department and the Drakenstein Municipality has gone a step further to move towards an integrated SDF / EMF. The intention is to have one integrated SDF / EMF in future and significant strides have already been taken. The reason is that it is important to have one vision of sustainable development to promote consistent decision-making. The municipality has thus, for example, in the SDF already started including information from the EMF and indicating where there are differences. Similarly, the EMF uses the some of the SDF information as baseline information and starts to ensure that the Environmental Management Zones are comparable with the Spatial Planning Categories of the SDF.

⁶⁴ Section 25(1) of the MSA.

⁶⁵ Section 35(1)(a) of the MSA.

⁶⁶ Section 25(1)(e) of the MSA.

⁶⁷ Section 34 of the MSA.

⁶⁸ Ordinance 15 of 1985.

⁶⁹ Act 32 of 2000.

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15. APPENDIX

APPENDIX A: DRAKENSTEIN DATA SOURCE LIST

| No. | Map Title | Data source |
|-----|--|---|
| 1. | Drakenstein Municipality EMF Study Area (includes all the town maps) | DEA&DP, Drakenstein Municipality |
| 2. | Vegetation Types- Remaining extent | SANBI BGIS |
| 3. | Threatened Ecosystems (original and remaining extent) | SANBI BGIS |
| 4. | Protected Areas | SANBI BGIS |
| 5. | Important biodiversity and ecological corridors | CapeNature |
| 6. | Flood Zones | Cape Winelands District Municipality |
| 7. | Rivers and wetlands | CSIR and Freshwater Consulting Group |
| 8. | Agricultural land-use and crops | Department of Agriculture |
| 9. | Agricultural land- irrigated and dry land | Department of Agriculture |
| 10. | Heritage and aesthetic resources | Drakenstein Municipality |
| 11. | Catchment and Water Management Areas | Department Water and Sanitation |
| 12. | Municipal Infrastructure | DEA&DP |
| 13. | Tourism and recreational resources | DEA&DP |
| 14. | Presence of state owned and land reform projects | DEA&DP |
| 15. | Renewable Energy Projects | DFFE |
| 16. | Fauna | Department of Agriculture |
| 17. | Heritage and aesthetic Resources | Drakenstein Municipality |
| 18. | Core 1 | Steep Slopes: DEA&DP. Refer to data sources above for other datasets displayed on the map |
| 19. | Core 2 | SANBI BGIS |
| 20. | Control Development | Substations: Eskom. Refer to data sources above for other datasets displayed on the map |
| 21. | Urban Development | Drakenstein Municipality |
| 22. | Industrial / Mining | Council of Geoscience (data between 10 and 15 years old) |
| 23. | Agricultural Development | Department of Agriculture |
| 24. | Cape Winelands Biosphere Zones | CapeNature |
| 25. | Completed map of all EMZs (EMF) | Refer to data sources above for other datasets displayed on the map |

***Disclaimer: Data sources to be revised.

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