ENVIRONMENTAL MANAGEMENT FRAMEWORK (EMF) FOR THE DIHLABENG LOCAL MUNICIPALITY:

Compiled by:

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For

Dihlabeng Local Municipality

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ABBREVIATIONS

CARA	Conservation of Agricultural Resources Act
CBD	Central Business district
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DOA	Department of Agriculture
DEAT	Department of Environmental Affairs and Tourism
DLM	Dihlabeng Local Municipality
DWAF	Department of Water Affairs and Forestry
ECA	Environment Conservation Act
EMF	Environmental Management Framework
EMP	Environmental Management Plan
FSDP	Free State Development Plan
FSPG	Free State Provincial government
FSPGDS	Free State Provincial Growth and Development Strategy
FSPSDF	Free State Provincial Spatial Development Framework
GDACE	Gauteng Department of Agriculture, Conservation, Environment and Land Affairs
IDP	Integrated Development Plan
LED	Local Economic Development
MDTP	Maloti Drakensberg Transfrontier Project
MEC	Member of the Executive Council
NBSAP	National biodiversity Strategy and action Plan
NEMA	National Environmental Management Act
NSBA	National spatial Biodiversity Assessment
PEIP	Provincial Environmental implementation Plan
SAWS	South African Weather Services
SASS	South African Scoring system
SDF	Spatial Development Framework
SAHRA	South Africa Heritage Resource Agency
SEMP	Strategic Environmental Management Plan
UNCCD	United Nations Convention to Combat Desertification

1. INTRODUCTION

Development entails making decisions on how to balance the utilisation of natural resources and their conservation. Since natural resources are the raw materials for development, the way these resources are managed can determine the sustainability or otherwise of development. The South African National Environmental Management Act (NEMA, Act 109 of 1998) defines sustainable development as „the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations". The environmental Impact Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998), make provision for Environmental Management Frameworks (EMFs) as regulatory instruments. EMFs are provided for in terms of NEMA EIA regulations 69-72. Provision is made for the initiation, adoption and use of EMFs as a proactive management decision support tool. EMFs can be used as strategic planning instruments through the coordinated management of information about an area and for the consideration of applications for environmental authorisations in terms of NEMA regulations.

According to the Department of Environmental Affairs" Guideline 6: Environmental Management Frameworks p3 (DEAT, 2005a), the objectives of an EMF should be to:

- „support the process of delineating geographical areas within which additional specified activities are to be identified in terms of NEMA";
- „support the process of delineating geographical areas within which activities listed in terms of NEMA may be excluded by identifying areas that are not sensitive to the potential impacts of such activities";
- „support informed and integrated decision-making by making significant and detailed information about an area available before activity proposals are generated";
- „contribute to environmentally sustainable development by anticipating potential impacts and by providing early warnings in respect of thresholds" limits and cumulative impacts"; and
- „support the undertaking of environmental impact assessments in the area by indicating the scope of potential impacts and information needs that may be necessary for environmental impact assessments".

This document describes an EMF for Dihlabeng Local Municipality (DLM). The steps followed in developing the EMF are:

i. Analysis and description of the status quo state of the environment;
ii. Defining the desired state of environment;
iii. Defining environmental management zones;
iv. Devising an environmental management plan for the defined zones;
v. Outlining an implementation plan for the EMF.

Involving the public is a key part of the process of developing an EMF as the EMF is meant to serve the interests of the public. A public participation process was undertaken to engage with interested and affected parties in the DLM in order to inform them about the EMF development process and to get information on environmental issues in DLM and to get views on the desired state of environment. The public participation process had two components: engaging and consulting with regulatory authorities in the area, i.e. officials of the DLM and the Free State provincial government and engaging with residents of DLM. The public participation process is described fully in section 5 of this document.

2. STATUS QUO OF THE DIHLABENG LOCAL MUNICIPALITY

2.1 Methodology

This section documents the environmental status quo of the Dihlabeng Local Municipality, Free State Province, as the first step in the process of developing an Environmental Management Framework for DLM. It details the biophysical environment of the DLM such as land use, including sensitive natural environments, areas unsuitable for human habitation and the state of degradation. The status quo analysis also covers economic resources and socio-cultural issues and provides a review of policy documents and plans which govern the DLM.
The process of developing the status quo report for DLM entailed the following:

1. *Review of documented information*

Various reports and documents including municipal reports such as the Spatial Development Framework (SDF) and Integrated Development Planning (IDP) reports were reviewed in order to access information on the environmental, social and economic status quo in DLM.

2. *Public participation*

The public participation process followed in conducting the status quo analysis involved engaging with and consulting with regulatory authorities and with residents of DLM as described in section 5.

3. *Ground truthing*

Drawing up the status quo report also involved ground truthing to verify information on spot images of the area. Ground truthing was conducted between 18 and 21 February 2008. The various points examined during the ground truthing exercise are described in Appendix 2.

4. *Mapping*

Wherever possible, the information on the environmental, social and economic status quo of the DLM has been spatially presented. The metadata used in mapping is shown in Appendix 6.

2.2 Location

The DLM is located in the south eastern part of the Free State Province in the Thabo Mofutsanyana District Municipality. The south and south eastern sides of the municipality share borders with the Kingdom of Lesotho. The municipality covers an area of 4,739.0 km^2 and consists of 19 wards, with a total of 38 councillors. The former Bethlehem, Clarens, Paul Roux, Fouriesburg and Rosendal Transitional Local Councils and sections of the former Drakensberg and Maluti Transitional Rural Councils are part of the DLM. There are five urban centres in Dihlabeng and these are: Bethlehem, Clarens, Paul Roux, Fouriesburg and Rosendal (Figure 1.1).

Bethlehem, situated on the N5 route between Bloemfontein and Durban, is the principal town in DLM and the eastern Free State and provides commercial services to the region. Bethlehem is situated 240 km north-east of Bloemfontein, 140 km east of Kroonstad and 90 km west of Harrismith. Clarens lies 34 km south east of Bethlehem and 20 km from the Golden Gate National Park. Clarens has developed into a tourist centre. Paul Roux is mainly a service centre for the surrounding agricultural area and is 40 km west of Bethlehem. Fouriesburg, 49 km from Bethlehem is also a service centre for surrounding agricultural communities. Rosendal is located in a rich agricultural area south west of Bethlehem and provides services to surrounding rural areas.

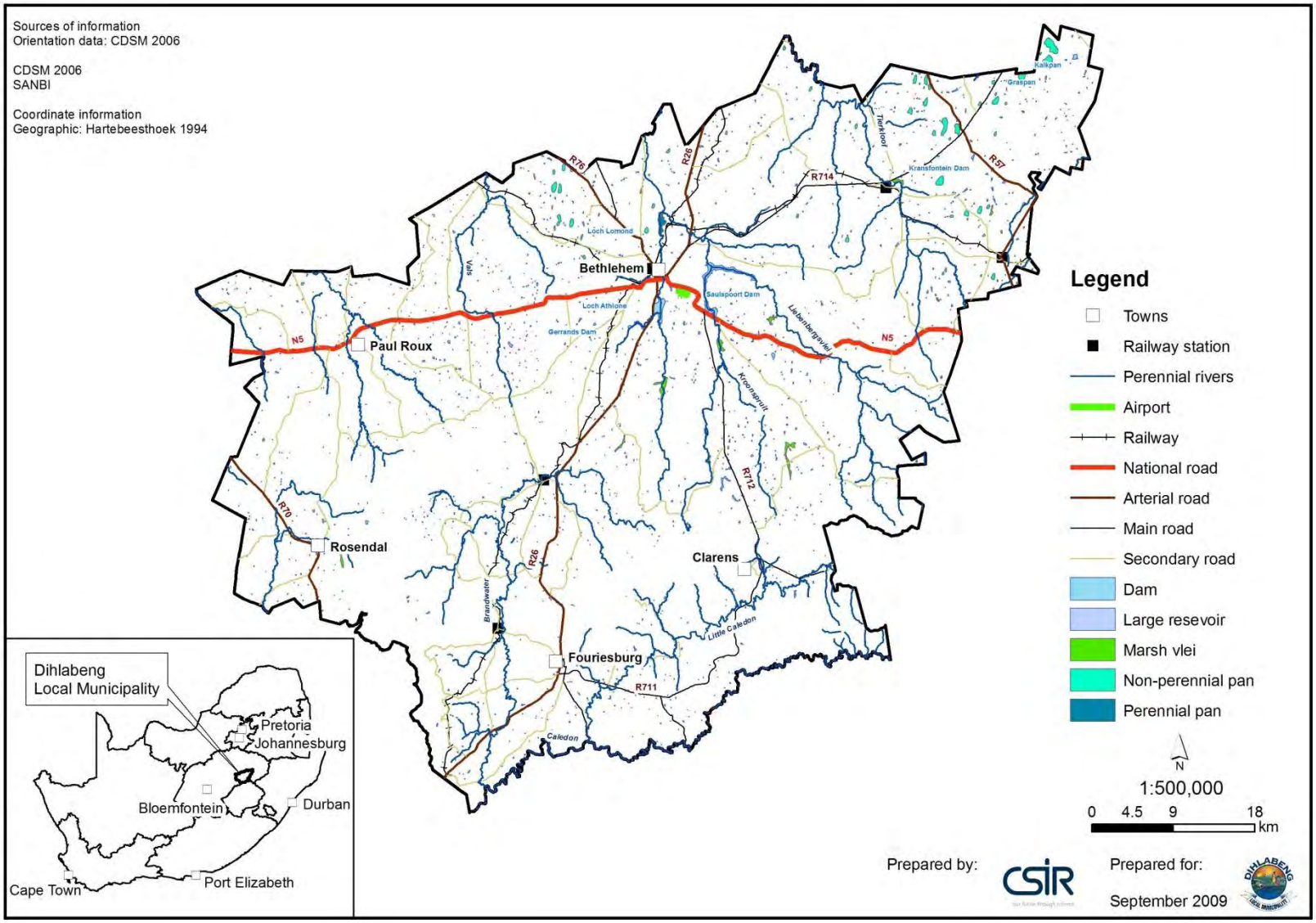

Figure 1.1: Location of the Dihlabeng Local Municipality.

2.3 Climate

The mean annual temperature in Dihlabeng ranges between 12 and 15^{o}C (Figure 2.1). The average monthly temperatures for Bethlehem, the main town in the DLM range from 3^{0}C in winter to 30^{0}C in summer, with the lowest temperature recorded between 1961 and 1990 being -8^{0}C (June) and the highest being 40^{0}C (January) (SAWS, 2007).

Rainfall in DLM is strongly seasonal, with most rain occurring as thunderstorms during the summer period. The rainy season in Dihlabeng runs from October to March. The average annual precipitation ranges from 540 to 1142 mm per annum (Figure 2.2). The average maximum rainfall per month is 96 mm while the minimum is 7 mm, and this is recorded in the dry season between April and September. The average rainfall in the area supports cultivation and as a result 48% of the region is currently under cultivation

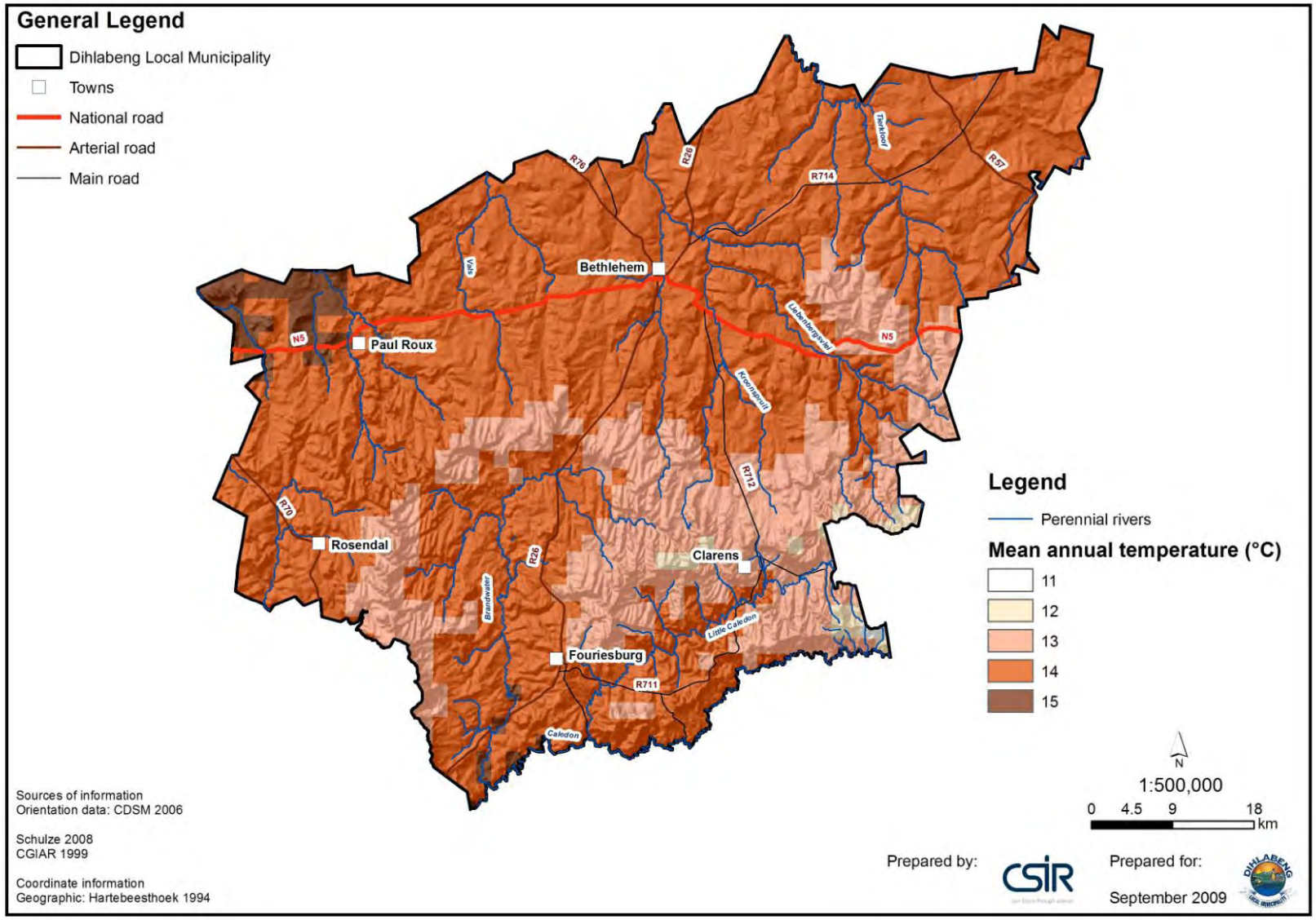

Figure 2.1: Mean annual temperature in Dihlabeng Local Municipality

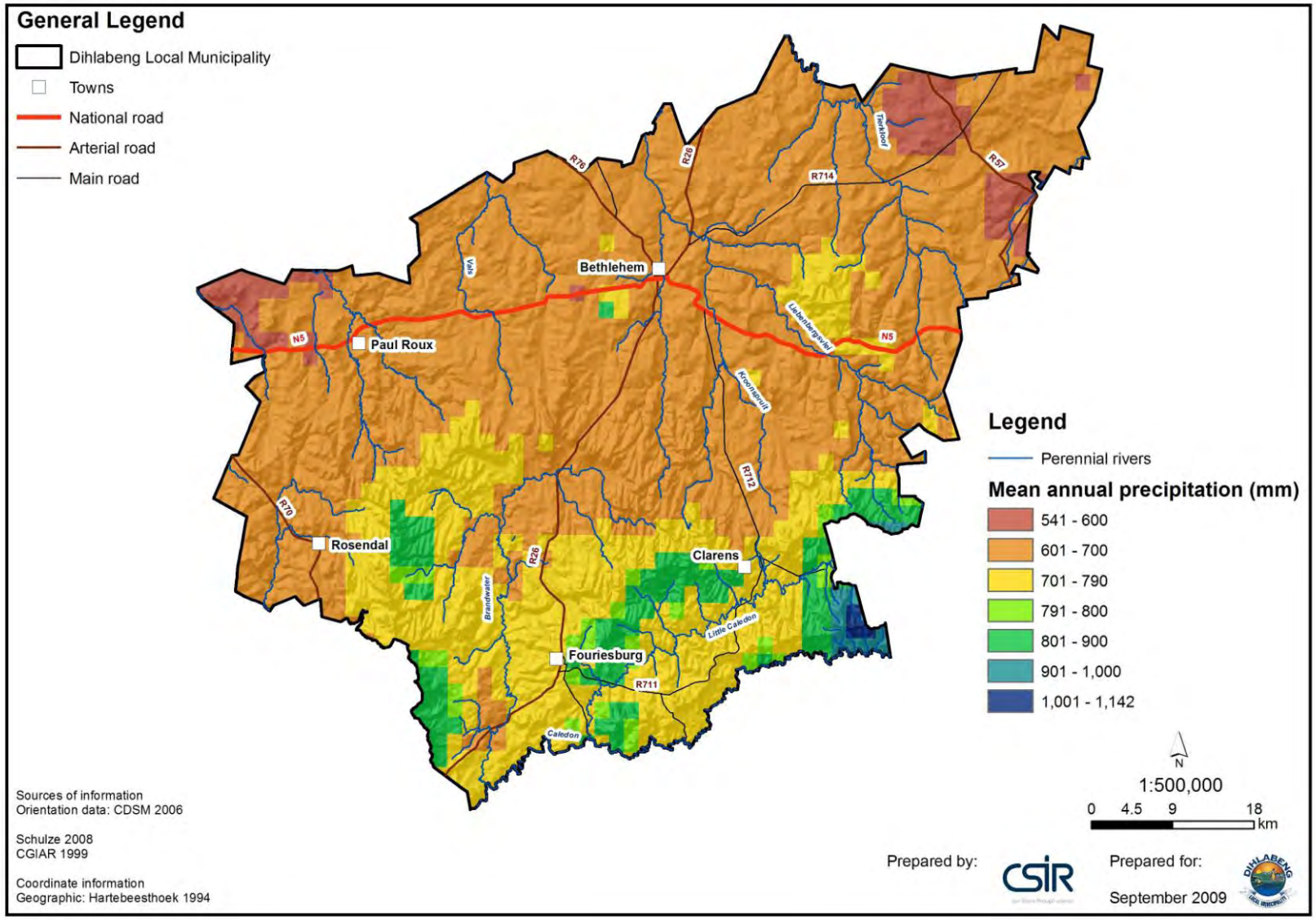

Figure 2.2: Mean annual precipitation in Dihlabeng Local Municipality

2.4 Land Cover

There are over 20 land cover types in Dihlabeng Local Municipality (Figure 2.3). The largest land cover type is unimproved natural grassland which covers just over half of the total area of DLM. Commercial dryland cultivation is the second largest land cover type followed by urban/built up areas and irrigated agriculture. Table 1 shows the main land cover types in DLM and their extent. .

Table 1: Main land cover types in Dihlabeng Local Municipality

Land use	Total hectares	%
Grassland, thicket bushland and rock	244309	51.39
Cultivated land	223057	46.92
Conservation	4345	0.91
Residential	2922	0.61
Forestry	701	0.15
Subsistence farming	64	0.01
Mining	22	0.005
Total	475420	100

Source: Dihlabeng Local Municipality Spatial Development Framework Review 2008/2009

2.5 Topography

The elevation in DLM varies between 1400 and 2600 metres above sea level (Figure 2.4), with the highest parts being in the central and south eastern parts of the municipality. Large parts of the DLM, mainly in the southern and central parts of the municipality have a slope greater than 7% (Figure 2.5) and this corresponds to the area of ridges. The aspect of DLM is shown in Figure 2.6.

The Gauteng Development Guidelines for Ridges define a ridge as any topographic feature in the landscape that is characterised by slopes of 5^{o} or more (GDACE, 2001). The GDACE definition and guidelines are used in this document as the Free State Provincial Government's Department of Economic Development, Tourism and Environmental Affairs does not have a ridges policy. Based on the GDACE guidelines, ridges mainly occur in the southern parts of DLM especially around Clarens and east of Rosendal (Figures 2.5 and 2.7). Ridges, due to varied topography and climate, are considered to have spatially heterogeneous, abiotic conditions that provide a greater diversity of potential niches for plants and animals than homogeneous landscapes. Ridges are thus generally characterised by high biodiversity. The conservation of ridges, in addition to providing habitat for species, can also provide future refuges for species. Due to the important role of ridges in biodiversity conservation, the Gauteng Development Guidelines for Ridges (GDACE, 2001) recommends the adoption of a strict no-go or low impact development policy for ridges.

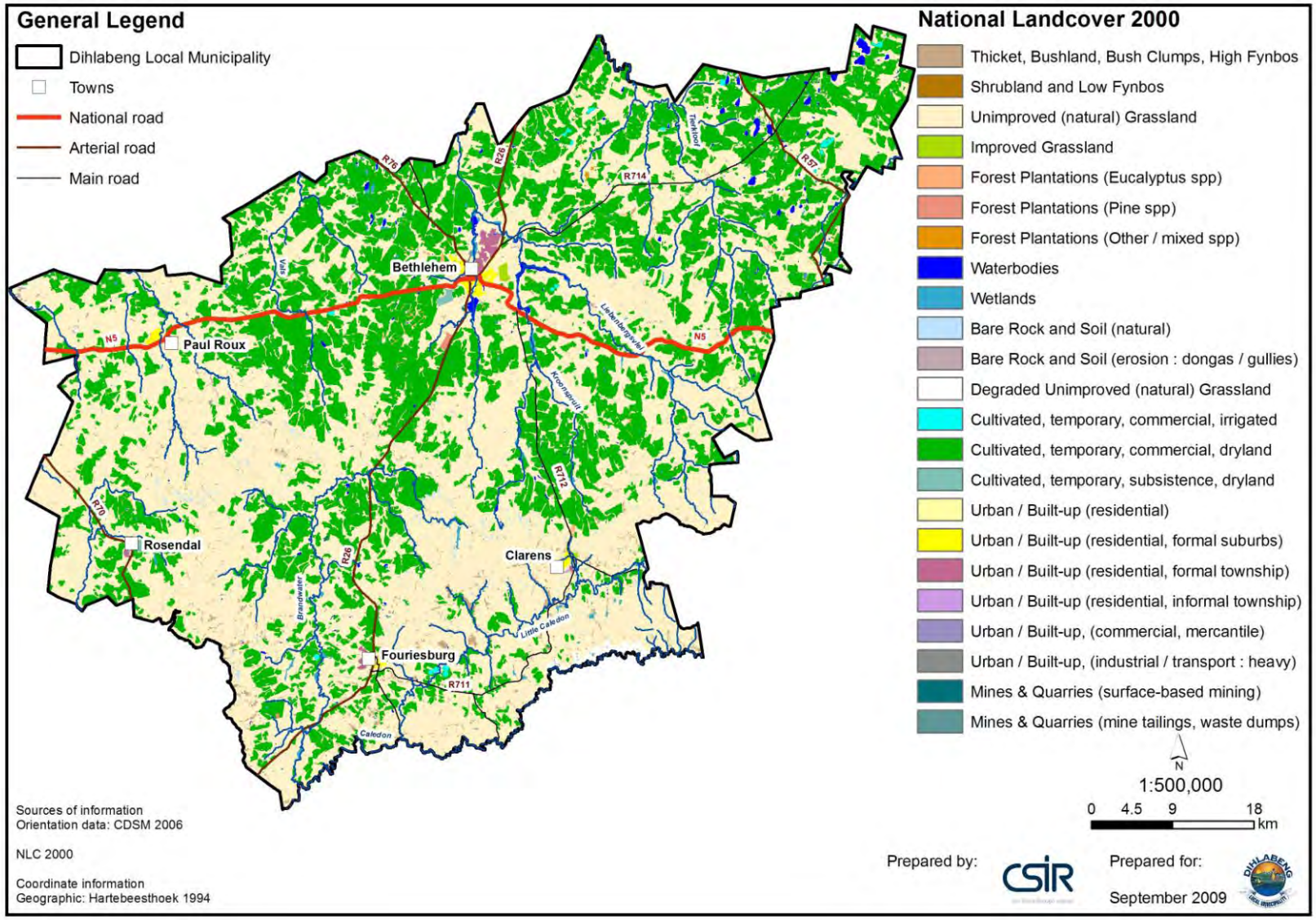

Figure 2.3: Land cover in Dihlabeng Local Municipality

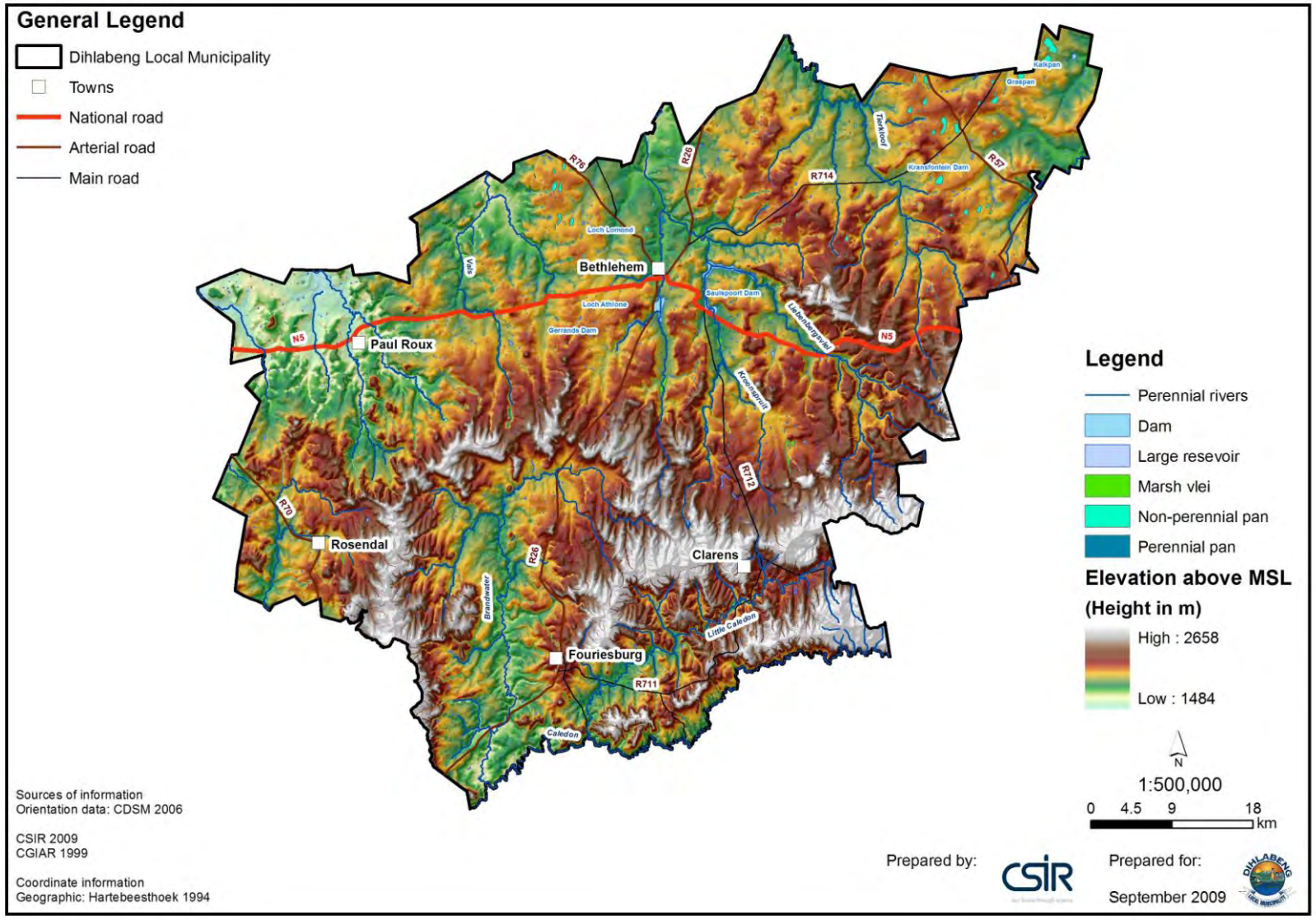

Figure 2.4: Elevation of Dihlabeng Local Municipality

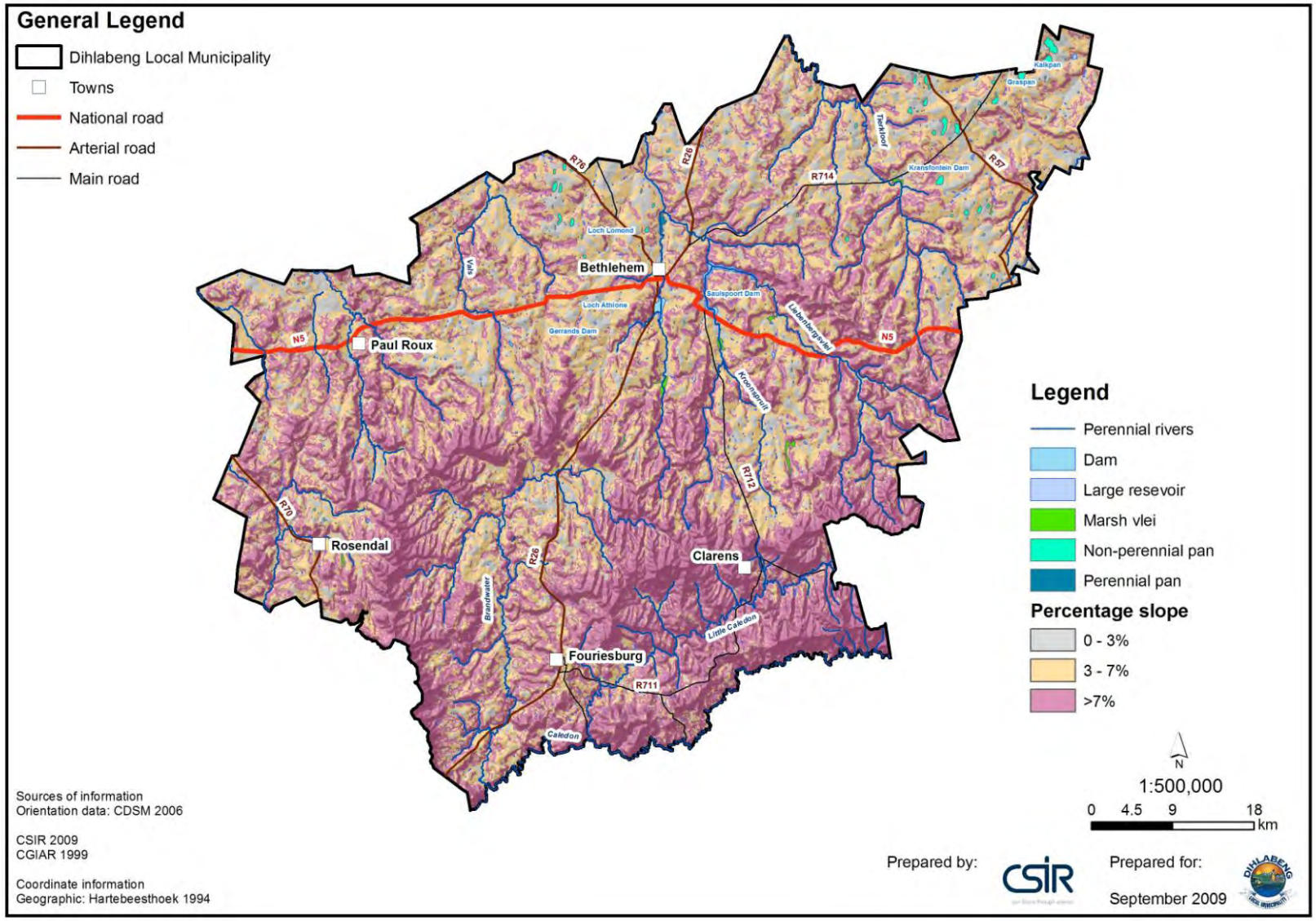

Figure 2.5: Percentage slope in Dihlabeng Local Municipality

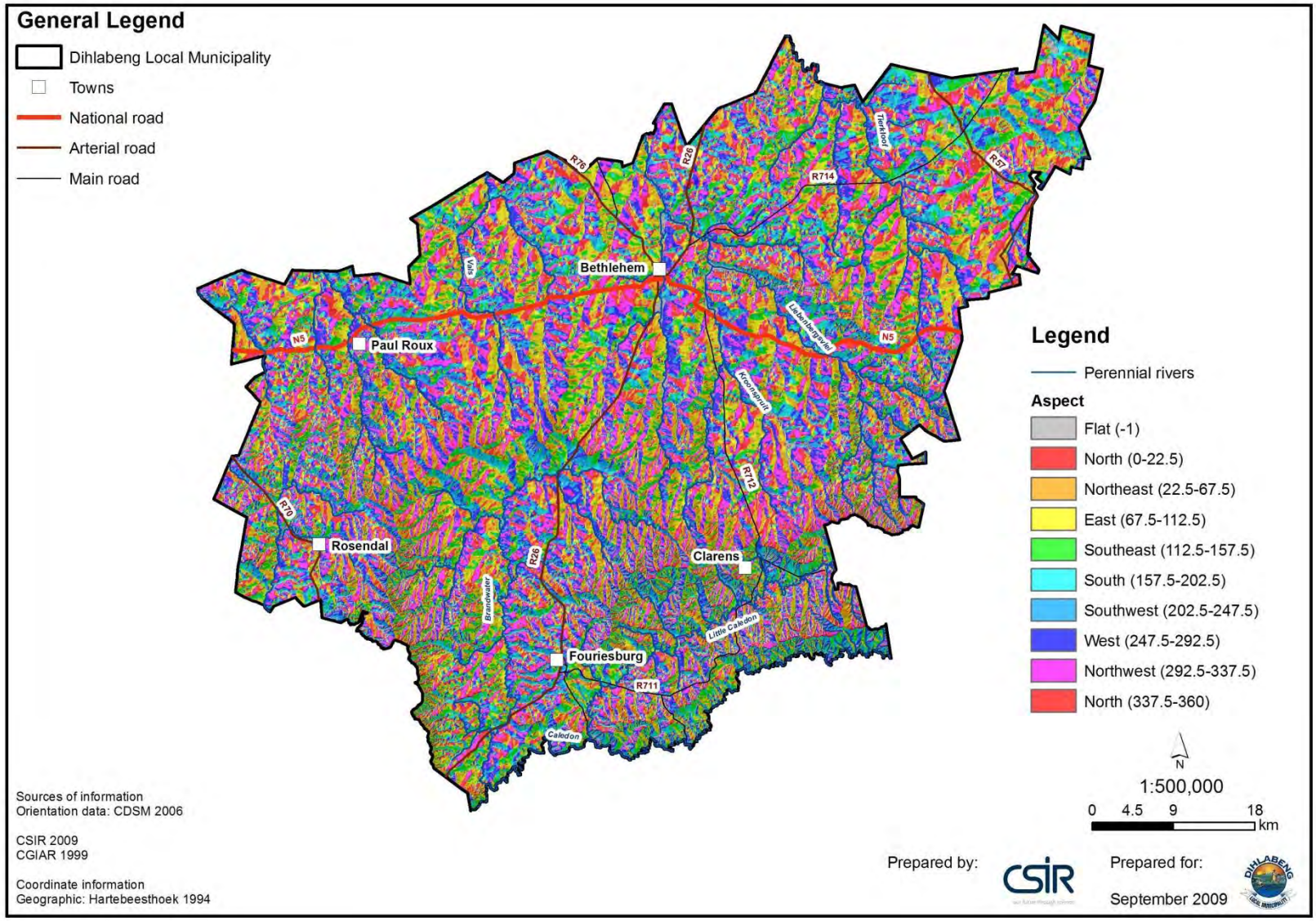

Figure 2.6: Aspect of Dihlabeng Local Municipality

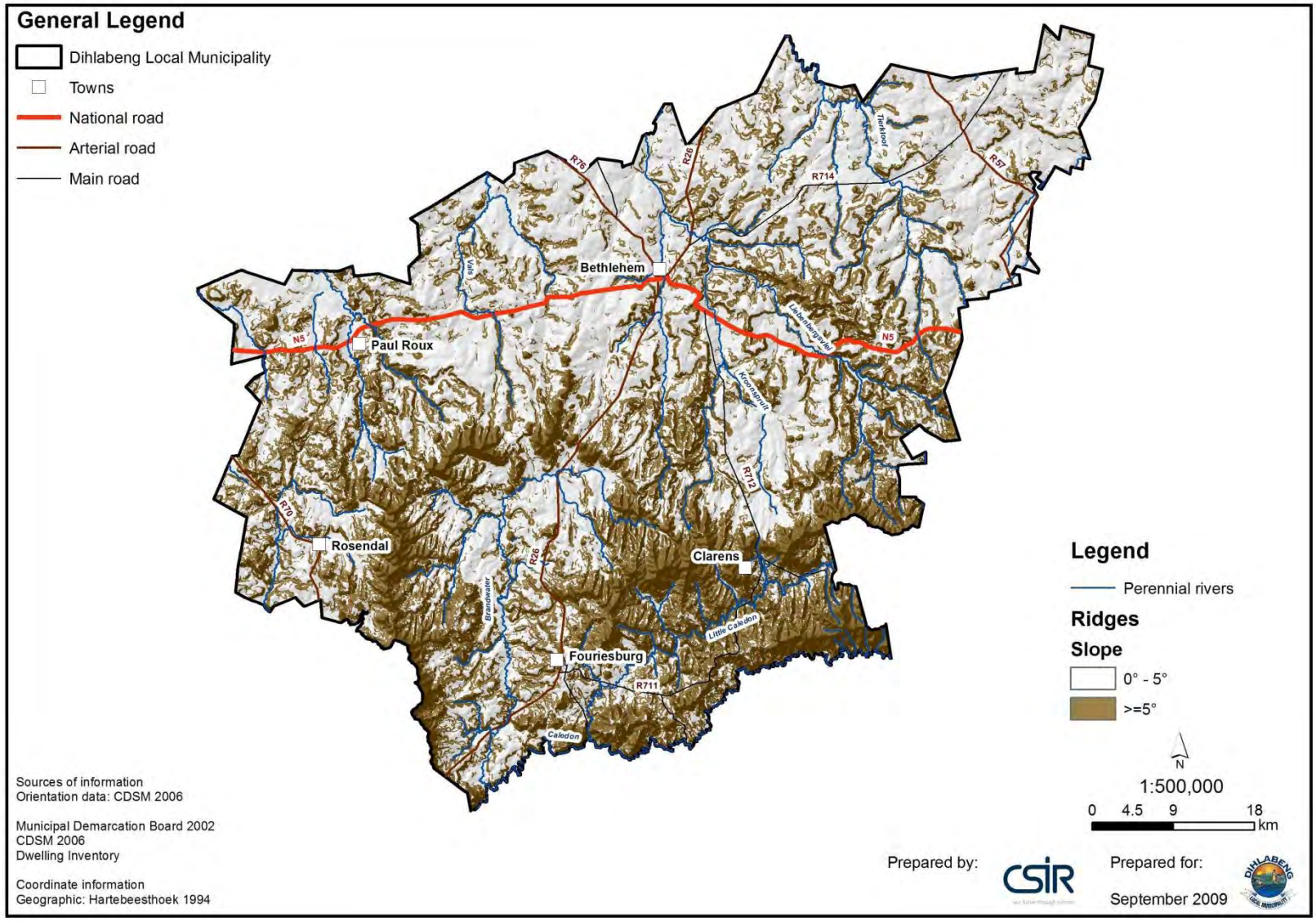

Figure 2.7: Dihlabeng Local Municipality Ridges

2.6 Geology

The geology of DLM is dominated by the Molteno formation (Figure 2.8). The Tarkastad subgroup also occurs and is largely found in the north eastern part of DLM. The Drakensburg and Clarens formations occur in the south west, the central and the south eastern part of DLM.

2.7 Hydrology

The DLM falls in the upper Vaal, middle Vaal and upper Orange River catchments. Dihlabeng‟s surface water is derived from a number of rivers and dams. The main rivers are Vals, Caledon, Little Caledon, Kroospruit, Liebenbergsvlei, Brandwater and upper Wilge (Figure 2.9). Surface water resources in DLM are well developed through dams. The water supply is augmented through transfer schemes which import water from other water management areas and from Lesotho. There are five dams in DLM, and these are: Loch Athlone, Gerrands, Menin, Loch Lomond and Saulspoort. The water used in Dihlabeng originates from other areas and upstream activities are reported to affect the quality of the water supply. In the upper Vaal catchment, the water is used for a diversity of purposes including manufacturing, mining, urban purposes and agriculture before DLM has access to it. The middle Vaal catchment is largely rural in nature with the land use characterised by extensive dryland agriculture (DWAF, 2003a).

In the Dihlabeng municipality, water is mainly used in urban areas, for irrigation and for rural purposes such as livestock farming (DWAF, 2003a). In the Wilge sub area of the upper Vaal catchment in which Bethlehem falls, more than half the water requirements are for urban use. Demand for water is projected to increase in future due to economic development and increasing urbanisation in the area. In addition to surface water, large quantities of ground water are abstracted through pumping for rural domestic supplies, stock watering, urban use and irrigation. There is little undeveloped ground water potential remaining (DWAF, 2003a).

The River Health Programme (2003) assessed the state of health of rivers in the Free State as being fair to poor due to degradation in some areas. River health is an integrated measure of the conditions that are necessary for proper river functioning. According to the River Health Programme (2003), a river that functions well has the ability to supply good quality water as well as services such as food for humans and animals, medicinal plants, building materials, self purification, food, erosion control, cultural value, tourism and recreation. Changes in the composition and structure of aquatic invertebrates highlighted the changes in the rivers‟ health conditions. Alien fish species such as trout, bass and carp occur in the rivers of the Free State while indigenous species such as the large mouth yellow fish are listed as near threatened (Free State Department of Tourism, Environmental and Economic Affairs, 2008). Inter-basin water transfers have impacted on the genetic integrity of fish species through the introduction of species from historically isolated populations.

In the DLM, the Liebenbergsvlei River‟s state of health was assessed as being fair. The Liebenbergvlei‟s source is in the Drakensberg Mountains in the Clarens region and is a part of the Upper Vaal catchment and is a tributary of the Wilge River (River Health Programme, 2003). Sixty four percent of the land in the Liebenbergsvlei catchment is natural grassland and is used for livestock grazing by small scale and commercial farmers. Commercial dryland farming occupies 32% of the land and less than 1% is used for irrigation (River Health Programme, 2003). However, there has been degradation and habitant destruction in the As-Liebenbergsvlei-Wilge River system as a result of the Lesotho Highlands Project. The project releases 14 cubic metres of water per second into the river and the high velocity of water has resulted in damage to the riverine habitat and negatively affected fish migration. The weirs on the river system have been modified to slow down the velocity of the water and prevent further damage to the habitat and allow for fish migration (River Health Programme, 2003).

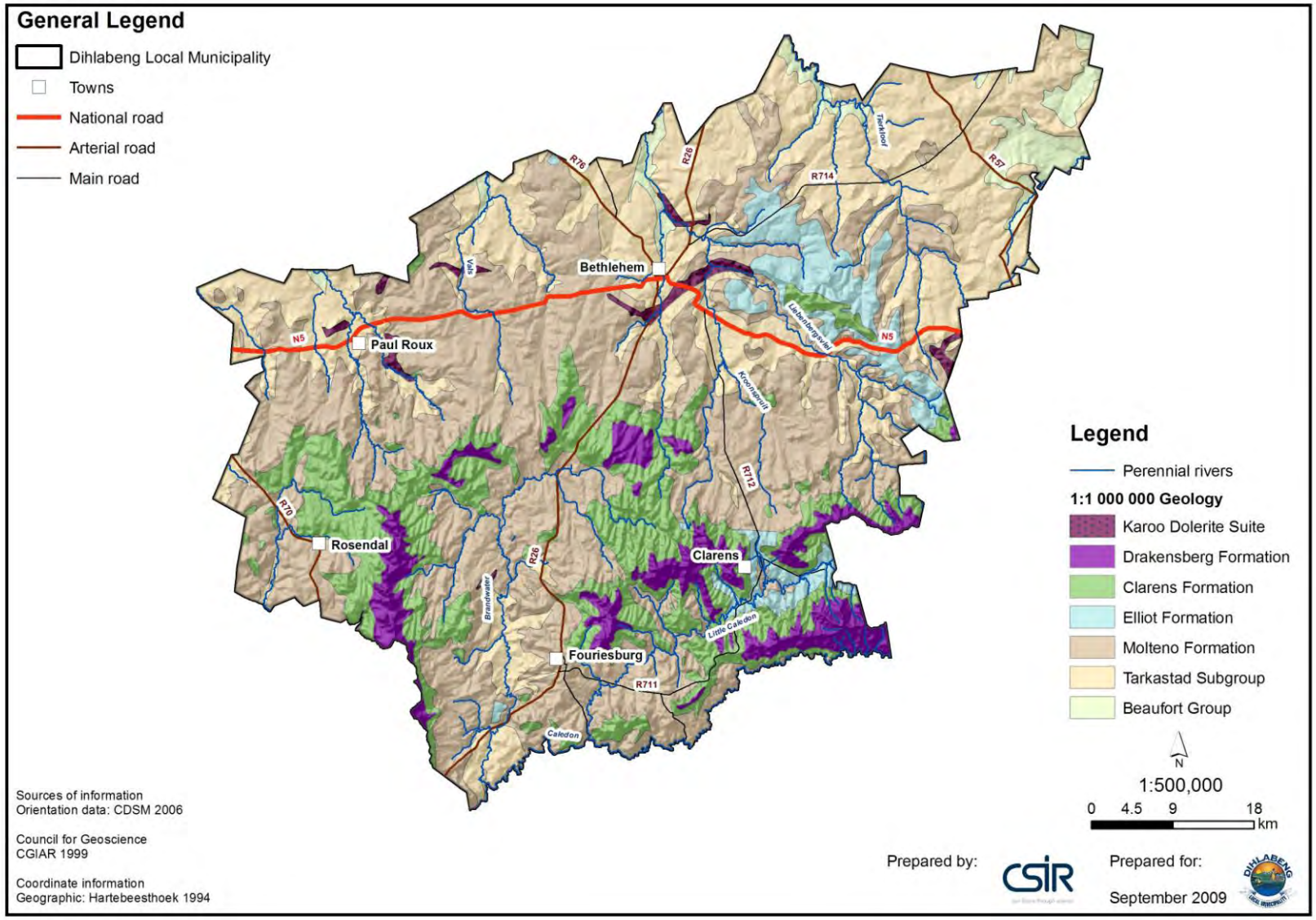

Figure 2.8: Geology of Dihlabeng Local Municipality

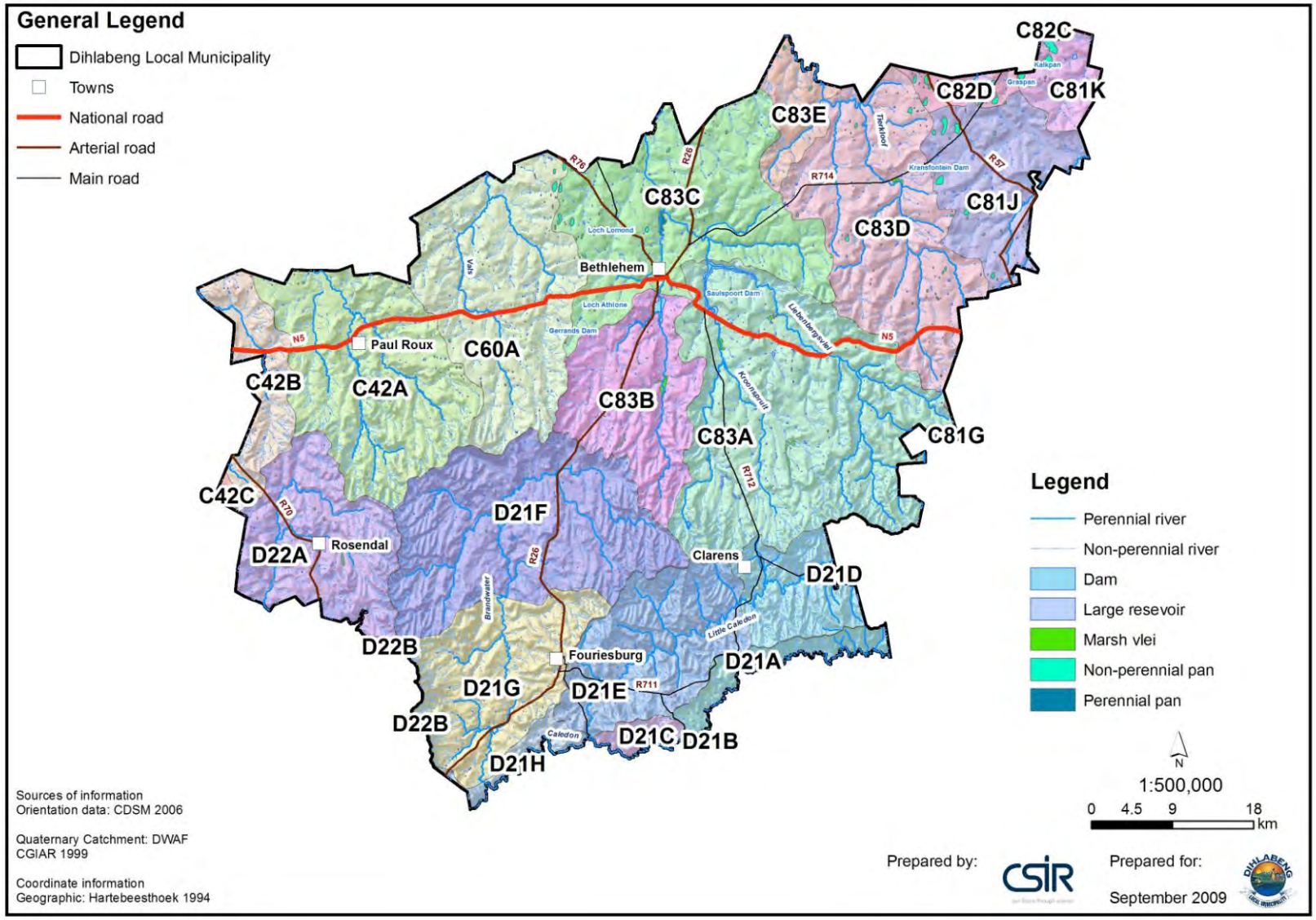

Figure 2.9: Hydrology of Dihlabeng Local Municipality

The River Health Programme assessment found the index for habitat integrity in the Liebenbergsvlei River to be poor, showing that mostly tolerant species of invertebrates are present and that there has been alien species invasion. Development activities such as the Lesotho Highlands Project and population growth in urban areas (increased pressure and poor management of sewage facilities) have affected the health of the river. Some of the pressures on the health of the river include:

- Urban and informal developments that result in runoff and point source discharge such as the municipal sewage discharges and seepage from rubbish dumps;
- Seepage and return flows from agriculture;
- Water transfer schemes which modify river flows.

The overall health of the Caledon River was assessed as being fair upstream of the Welbedacht Dam and poor downstream. Sixty percent of the 22 000 km^2 of the Caledon catchment is grassland and bossieveld. Thirty three percent of the catchment is used for dryland production of maize and wheat. The Caledon-Modder system transfers about 59 million cubic metres of water per year to serve urban centres. The Caledon River scored low on the South African Scoring System (SASS) which looks at how the health of the river influences the aquatic invertebrate composition and structure as fish assemblage in the river is poor (River Health Programme, 2003). Although the Caledon catchment has almost 100% grassland cover, poor management practices result in high sediment yields hence the health of its riparian zone is poor.

The overall health of the Wilge River was found to be fair to poor, deteriorating downstream due to large scale agricultural activities (River Health Programme, 2003). The headwaters of the Wilge were found to be generally well oxygenated with neutral pH and low turbidity. Exceptions occurred downstream of sewage treatment works where high concentrations of nutrients encouraged excessive growth of algae.

The River Health Programme (2003) made the following recommendations for improving river health:

- Manage the operation of water works to ensure that all effluent that is discharged is of a quality that meets acceptable standards;
- Identify sources of pollution and enforce the law;
- Communicate and create awareness through stakeholder meetings;
- Clear alien vegetation from wetlands;
- Ensure that flow releases from dams simulate natural flow patterns and natural water temperatures by releasing surface water;
- Manage water transfer schemes in such a way as to minimise soil erosion and habitat degradation;
- Consider the use of pipes to transfer water between systems.

2.8 Water Quality

Water quality is a term used to describe the microbial, physical, chemical, toxicological and radiological properties of water. The quality of water must be appropriate for the different uses of water such as domestic, irrigation, livestock watering, recreation and aquatic ecosystems. The quality parameters for different uses of water have been defined in the water quality guidelines issued by the Department of Water Affairs and Forestry (1996). In DLM, surface water is reported to be generally of good quality particularly in streams upstream of urban areas and sewage treatment plants (DWAF, 2003a). However, large quantities of urban and industrial effluent together with urban wash-off and mine pumpage have a major impact on water quality in some tributaries of the upper Vaal (DWAF, 2003a).

In the upper Vaal, water quality varies from poor in the highly developed catchments to good in the less developed areas. Localised water quality problems are experienced within the Wilge River sub-catchments due to sewage works treatment discharge and poorly managed sewage reticulation and rapid urban development (Free State Department of Tourism, Environmental and Economic Affairs, 2008). The water quality problems in the Wilde sub-catchment have mainly emanated from outside DLM. In the middle Vaal, the quality of water received from the upper Vaal is generally poor due to salinity and nutrient pollutants. Localised water quality problems also occur in the middle Vaal due to discharges from sewage treatment works. The Free State Department of Tourism, Environmental and Economic Affairs (2008) reports that water quality in the Upper Orange River varies from poor in the highly developed areas to good in areas that are not well developed. Water quality problems also occur in the Upper Orange River catchment due to discharges from sewage treatment works.

Although water quality problems have been reported in river catchments which the DLM shares with other municipalities, average quality parameters monitored in surface water at various sites in DLM by the Department of Water Affairs (Table 2) are within the target water quality ranges as defined in the South African water quality guidelines for domestic use and irrigation use (DWAF, 1996a, b). Limited information is generally available on groundwater quality in the Free State (Free State Department of Tourism, Environmental and Economic Affairs (2008). Monitoring of various boreholes in DLM shows that groundwater is generally of a high quality (Table 3). As agriculture can be a diffuse source of contamination for ground water, particular attention needs to be paid to this aspect since DLM is an agricultural area. Nitrates are the contaminant of most concern, and areas of intense cultivation are generally the major contributors of inorganic nitrates at a local scale (DWAF 2003b). The primary inorganic nitrates which may contaminate water are potassium nitrate and ammonium nitrate, and both are widely used as fertilisers. Herbicides and pesticides are the other potential contaminants in agricultural areas. According to DWAF (2003b), the contribution of fertilisers, pesticides and herbicides to groundwater contamination is very difficult to quantify on a catchment scale and site specific data relating to likely loading/application volumes and history, soil profile and local geo-hydrology are required. The contribution of each farm on a local scale is often fairly small, but the contribution on a catchment scale needs be included in assessing and monitoring the pollution situation (DWAF 2003b). A DWAF report (2003b) points out that findings regarding issues of ground water pollution from agriculture can only be assessed in a generic way due to the lack of real data in the Water Management Area in which Dihlabeng Local Municipality falls. Poor management of sewage treatment works could contribute to pollution of groundwater if raw sewage is discharged directly into evaporation pans. Other potential sources of pollution are landfill sites. Some localised groundwater pollution from food factories in the Renoster/Vals catchment was noted in the area of jurisdiction of DLM (DWAF, 2003b).

The properties of water at various domestic water treatment plants in DLM monitored by the Department of Water Affairs (http://www.dwaf.gov.za/iwqs/wms/data/WMA08_reg_WMS_nobor.htm 2009) are within the target water quality ranges for domestic water as defined in the South African water quality guidelines for domestic use (DWAF 1996a). Water at the Bethlehem Sewage works final effluent and the Clarens sewage works discharge to Little Caledon River meets the water quality requirements for irrigation water for all parameters measured (Table 4) except for conductivity (DWAF, 1996b). The average conductivity of 56.88 and 82.3 mS/m recorded at Bethlehem sewage works and Clarens sewage works respectively is above the maximum conductivity of 40 mS/m for irrigation water as defined in the South African water quality guidelines for irrigation (DWAF, 1996b). There are, however, instances when water quality problems are detected in DLM- for example, in 2007 problems of faecal coliforms in wastewater treatment effluent were reported in DLM (Free State Waste Water Quality Report, December 2006). The DLM mostly complies with health requirements for drinking water, achieving 100% compliance with health requirements in 2008 (www.wqms.co.za/download/reports/311/2008/1_December.pdf).

Table 2: Quality of surface water from some designated sampling points in Dihlabeng Local Municipality

Parameter	Sampling site							
	C42_90797 Allemanskraal Dam on Sand River: Left Canal	**C83_90895 Gerrands Dam on Gerrands Spruit: near Dam Wall**	**C83_90894 Loch Athlone Dam on Jordan river near Dam Wall**	**C83_90803 Saulspoort Dam on Liebergsvlei River near Dam Wall**	**D21_101808 Caledonspoort 190 The Poplars 199 at the Poplars**	**D21_184432 Caledons Poort Camelroc**	**D21_169645 Letterboom dup name 26397**	**D21_161536 Karmel dup name 20604**
Flow m3/s	2.8				2.8			
Conductivity mS/m EC	29.35	31.7	36.36	32.04	43.10	52.56	5.5	24.2
TDS mg/L	221	246	292	255	357	382	35	187
pH	8.3	8.3	8.4	8.31	8.38	8.55	7.34	6.68
Ca mg/L	18.49	22	25.41	30.3	46.4	55.03	3.7	14.4
Mg mg/L	7.82	8.52	12.53	11.1	20.4	8.23	1.9	3.8
K mg/L	6.54	8.18	8.07	5.67	2.89	1.1	2.77	1.53
Na mg/L	23.68	25.86	31.2	17.9	16.8	37.58	1	38.1
Total alkalinity mg/L	117	132	152	135	204	201	14.7	91.3
Chloride mg/L	10.95	12.82	16.67	9	8.9	15.29	1.5	12
Fluoride mg/L	0.41	0.41	0.39	0.4	0.24	0.63	0.1	1.23
Silica mg/L	5.71	4.11	5.42	7.28	12.79	10.09	9.32	10.04
Sulphate mg/L	23.77	19.97	23.66	18.08	18.95	32.58	6.1	2
NH_4 (N) mg/L	0.13	0.1	0.09	0.09	0.09	0.07	0.02	0.11
NO_3(N) mg/L	0.48	0.53	0.2	0.25	0.18	0.55	0.02	0.25
KN mg/L	0.9	1.75	0.79	0.95				
PO_4 (P) mg/L	0.14	0.07	0.06	0.06	0.07	0.02	0.005	0.08
TP mg/L	0.21	0.75	0.11	0.07				

Source: http://www.dwaf.gov.za/iwqs/wms/data/WMA08_reg_WMS_nobor.htm (2009)

Table 3: Quality of groundwater from some designated borehole sampling points around Dihlabeng Local Municipality

Parameter	Sampling site				
	C42_148930 Utopia	**C42_148935 Paul Roux Dorp**	**C83 148796 Bethlehem Dorp**	**D21 148684 Slaberts**	**D21_148679 Fouriesburg Dorp**
Conductivity mS/m EC	68	33	46	41.6	41.38
pH	8.29	8.57	8.7	7.6	8.02
Ca mg/L	22	12	10	35.2	32.96
Mg mg/L	18	2	2	11.2	10.9
K mg/L	3	1.55	1		
Na mg/L	99	55	111		
Total alkalinity mg/L	306	134	176	160	187
Chloride mg/L	23	11	50	26	21.2
Fluoride mg/L	0.5	1.75	2.25	0.2	0.9
Silica mg/L				40	19.8
Sulphate mg/L	13	13	15		
NH_4 (N) mg/L			2.03	0.9	
NO_3(N) mg/L	1.81	0.9			3.11
KN mg/L					
PO_4 (P) mg/L	0.003	0.003	0.003		
TP mg/L					

Source: http://www.dwaf.gov.za/iwqs/wms/data/WMA08_reg_WMS_nobor.htm (2009)

Table 4: Quality of treated water from various sites in Dihlabeng Local Municipality

Parameter	Sampling site				
	C83_189589 Bethlehem at R49 stop Drinking water	C83_189591 Bethlehem Metropolitan drinking water	C83_189590 Saulspoort Drinking Water at Saulspoort water purification	C83_100000510 Bethlehem sewage works final effluent	D21_300000089 Clarens sewage works discharge to Little Caledon
Conductivity mS/m EC	12.5	11.5	13.6	56.88	82.3
pH	9.4	9.35	8.88	7.69	8.41
Ca mg/L	15.1	13.6	13.25	34.56	
Mg mg/L	4.5	4.5	6.3		
K mg/L	0.8	0.75	0.58		
Na mg/L	99.32	11.17	40.78	55.02	
Total alkalinity mg/L	51.8	55.6		162	
Chloride mg/L	5.55	7	9	65	
Fluoride mg/L	0.05	0.05	0.11	0.05	
Silica mg/L					
Sulphate mg/L	5	5	12.6	47.3	
NH_4 (N) mg/L	0.3	0.35	0.6	5.7	16.15
NO_3(N) mg/L	0.4	0.46	0.4	11.2	
KN mg/L					
PO_4 (P) mg/L	0.005	0.05	0.38	2.6	10.51
TP mg/L	1	1			

Source: http://www.dwaf.gov.za/iwqs/wms/data/WMA08_reg_WMS_nobor.htm (2009)

2.9 Ecology

The DLM falls within the grassland biome (Figure 2.10). The main vegetation types in Dihlabeng are shown in Figure 2.11. The grassland biome in the Free State is home to a range of species of flora and fauna, some of which are Red Data listed such as the Grey Crowned Crane, Cape Vulture and Blue Crane (River Health Programme, 2003). The south eastern part of Dihlabeng municipality including Clarens and surrounding areas falls in the Eastern Mountain Biodiversity Hotspot (the Maloti-Drakensburg mountains biodiversity hotspot) (MDTP, n.d.) and the Golden Gate Highlands National Park. Globally significant plant and animal biodiversity occurs in the area. The area is also an important water catchment for Lesotho and South Africa. The area provides habitat for a range of specialised floral and faunal species with up to 300 endemic and about 500 near endemic flowering plant species (MDTP, n.d.). About 11% of these endemic and near endemic species are listed as red data species (Carbutt, 2004). The area also provides habitat for specialised faunal species, among them the Cape Vulture (*Gyps coprotheres*), classified as globally vulnerable and the rare Bearded Vulture (*Gypaetus barbatus)* which is classified as rare (Collar et al. 1994). Other raptors, such as Black or Verreaux"s Eagle (*Aquila verreauxii*), also occur in the area. A few large animals such as the Grey Rhebuck (*Pelea capreolus*) and Grey Duiker (*Sylvicapre grimmii)* are found in the area. (MDTP n.d.).

Transformation has occurred in the grassland biome due to developments such as urban settlements, mining, agriculture, and industry (Free State Department of Tourism, Environmental and Economic Affairs, 2008). The transformation has resulted in loss of biodiversity and ecosystem services. In DLM, the Eastern Free State Sandy Grassland vegetation around Bethlehem is threatened by human activities. Climate change and pollution also threaten biodiversity. The Eastern Free State Clay Grassland and the Eastern Free State Sandy Grassland are endangered (Table 5). The Lesotho Highland Basalt Grassland, Northern Drakensberg Highland Grassland and Northern Free State Shrubland are least threatened. Endangered vegetation types account for most (83%) of the vegetation area while least threatened vegetation accounts for less than 10% of the vegetation area (Table 5 and Figure 2.12). The terms used to describe the status of grasslands in this context are based the South African National Spatial Biodiversity Assessment definitions (Rouget et al., 2004):

- *Endangered* vegetation types have lost more than 40% of their original extent and are exposed to partial loss of ecosystem function;
- *Vulnerable* vegetation types have lost more than 20% of their original extent which could result in some ecosystem functions being altered;
- *Least threatened* vegetation types – no significant disruption of ecosystem functioning is assumed. More than 80% of their original extent is untransformed.

The riverbanks in Dihlabeng host a unique vegetation type known as „riparian bush" or „gallery bush". This vegetation is distinctive to the Free State and North West provinces. Riparian bush generally consists of indigenous trees and dense undergrowth although alien vegetation such as poplar and blue gum trees can also occur. Some of the indigenous trees which occur in riparian areas are White Stinkwood (*Celtis africana*), Wild Olive (*Olea africana*), Buffalo Thorn (*Ziziphus mucronata*), Sweet Thorn (*Acacia karoo*) and Bush Willow (*Salix capensis*). Riparian bush stabilises riparian areas and protects against erosion and provides habitat for birds and animals.

2.9.1 Environmental concerns in DLM

Most of the land area of DLM is covered by grassland (Figure 2.11). The Dihlabeng environment, due to its endangered vegetation is mostly sensitive. In addition to vegetation, sensitive areas in Dihlabeng also include riparian areas, dams, ridges and wetlands. The sensitive areas in Dihlabeng are shown in Figure 2.13. The environment in Dihlabeng is generally in a good condition (Dihlabeng IDP Analysis, 2009/2010). However, injudicious subdivision of land for change in use or land redistribution can lead to mismanagement of land

and inefficient use of resources. The major challenges that are being experienced with regard to environmental conservation in Dihlabeng are:

- Silting-up of dams;
- Smoke pollution (mainly of fires for cooking purposes and veld fires) creates a potential health danger and also has an influence on the ecosystem;
- The lack of proper sanitation poses a serious threat of pollution of underground water which in turn influences health;
- Littering;
- Overgrazing and erosion; and
- Vegetation is currently being depleted at a rapid rate for fire wood.

(Dihlabeng IDP Analysis, 2009/2010).

These factors have negative effects on the environment itself and are also detrimental to tourism and economic growth. Land management by emerging farmers in the area is also a concern. According to the Dihlabeng IDP Analysis (2009/2010), emerging farmers do not currently receive any guidance or training in terms of soil conservation and there is a need to provide them with training. In DLM, riparian areas are valuable for tourism however such areas are sensitive. The EMF for Dihlabeng should take cognisance of current, planned and potential economic activities in riparian areas. Economic development initiatives should balance economic development and conservation. Some of the conservation activities would directly enhance sectors such as tourism as some tourism ventures are based on conservation of natural resources.

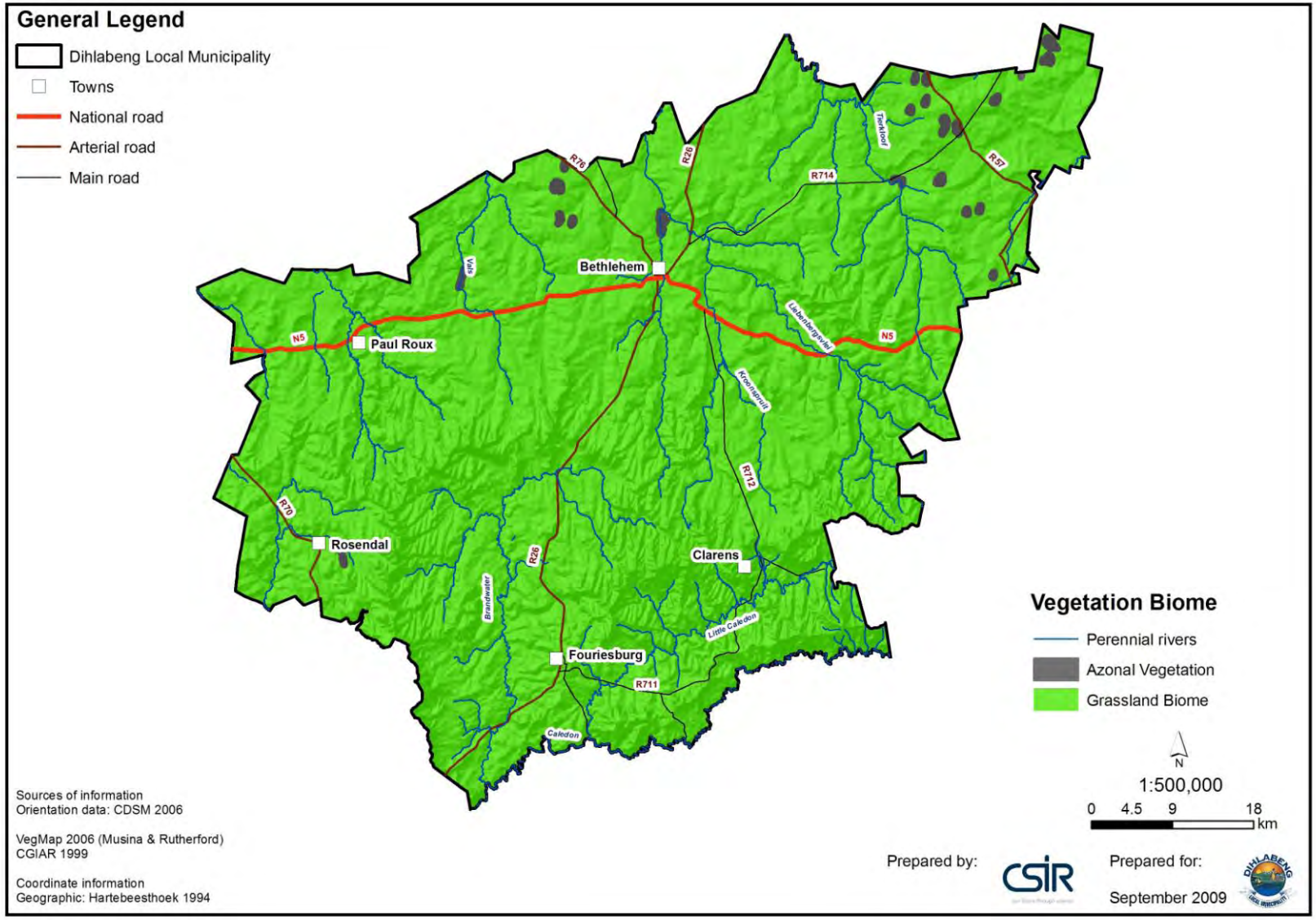

Figure 2.10: Biomes of Dihlabeng Local Municipality

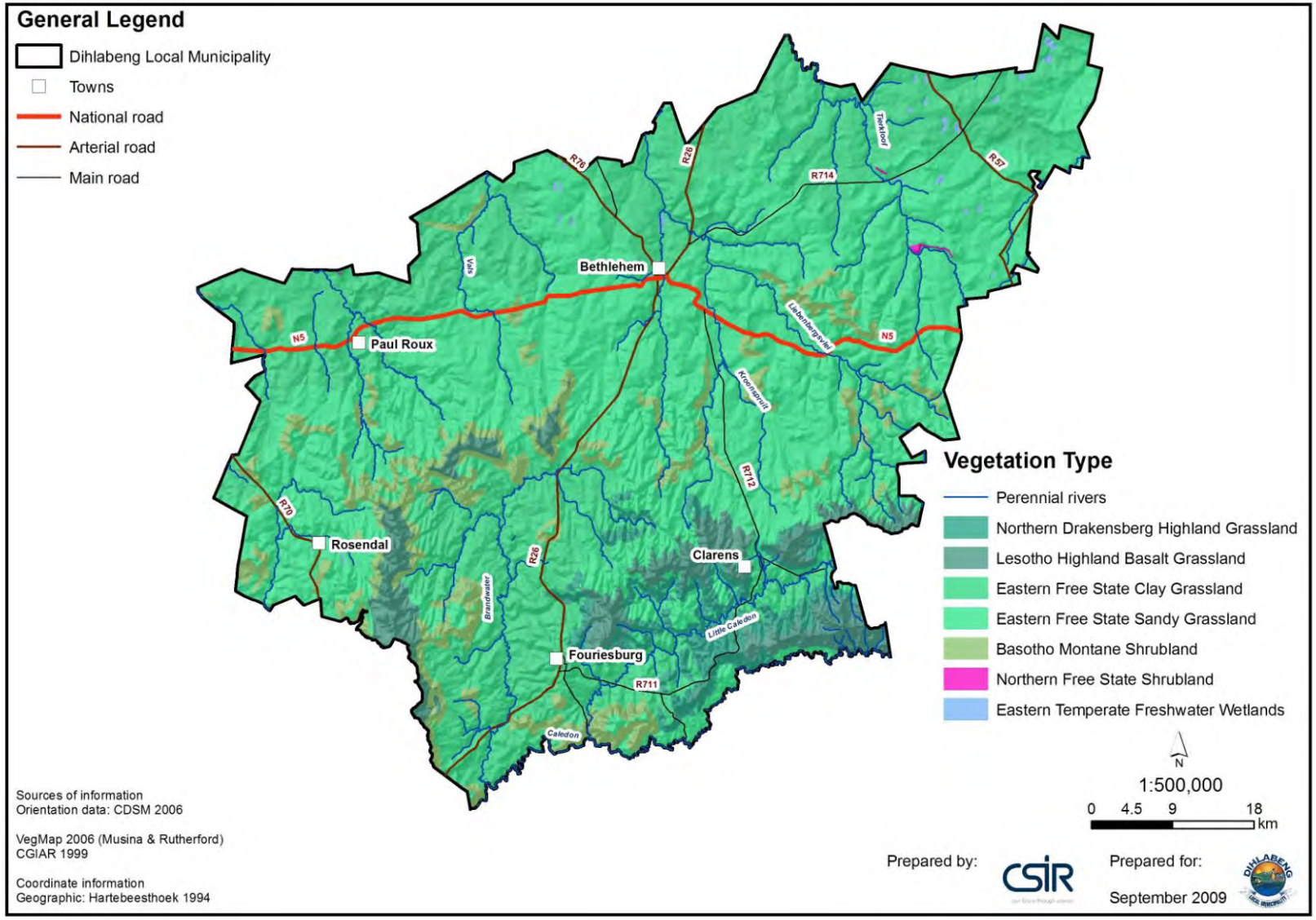

Figure 2.11: Vegetation of Dihlabeng Local Municipality

Table 5: Conservation and protection status of different vegetation types in Dihlabeng Local Municipality.

Vegetation type	Conservation status	Biome	Group	Bioregion	Protection status	Area_km^2	Area%
Basotho Montane Shrubland	Vulnerable	Grassland Biome	Mesic Highveld Grassland Bioregion	Mesic Highveld Grassland Bioregion	Poorly protected	359.29245	7.578563
Eastern Free State Clay Grassland	Endangered	Grassland Biome	Mesic Highveld Grassland Bioregion	Mesic Highveld Grassland Bioregion	Hardly protected	1626.74958	34.31306
Eastern Free State Sandy Grassland	Endangered	Grassland Biome	Mesic Highveld Grassland Bioregion	Mesic Highveld Grassland Bioregion	Poorly protected	2308.23085	48.68756
Eastern Temperate Freshwater Wetlands	Least threatened	Azonal Vegetation	Freshwater Wetlands	Freshwater Wetlands	Poorly protected	10.43328	0.220069
Lesotho Highland Basalt Grassland	Least threatened	Grassland Biome	Drakensberg Grassland Bioregion	Drakensberg Grassland Bioregion	Hardly protected	254.99285	5.37857
Northern Drakensberg Highland Grassland	Least threatened	Grassland Biome	Drakensberg Grassland Bioregion	Drakensberg Grassland Bioregion	Well protected	179.09749	3.777707
Northern Free State Shrubland	Least threatened	Grassland Biome	Mesic Highveld Grassland Bioregion	Mesic Highveld Grassland Bioregion	Not protected	2.10798	0.044464
Grand Total						4740.90448	

SUMMARY

Conservation Status	Area_km^2	Area %
Endangered	3934.98043	83.00062671
Vulnerable	359.29245	7.578563363
Least Threatened	446.6316	9.42080993

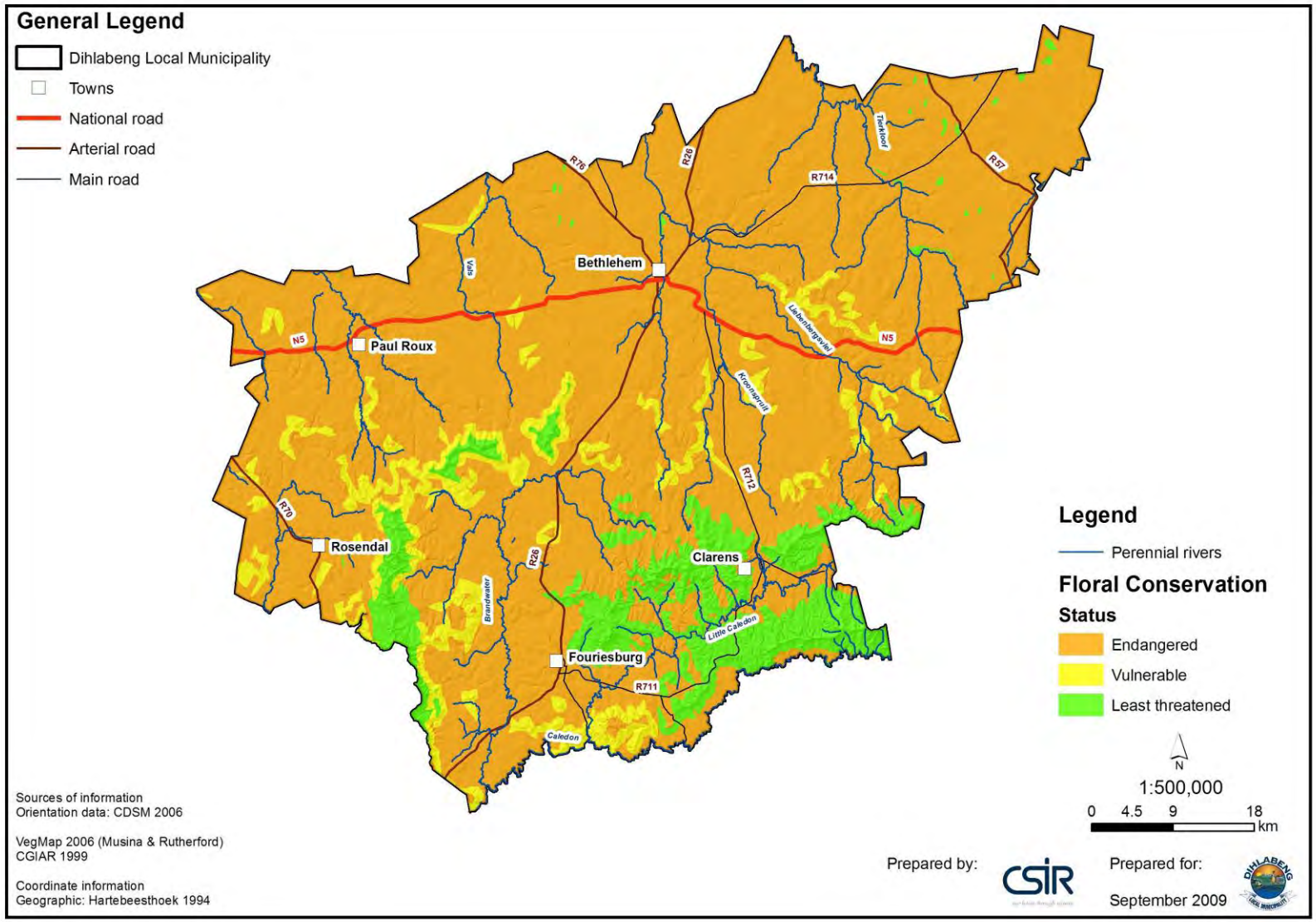

Figure 2.12: Conservation status of vegetation in Dihlabeng Local Municipality

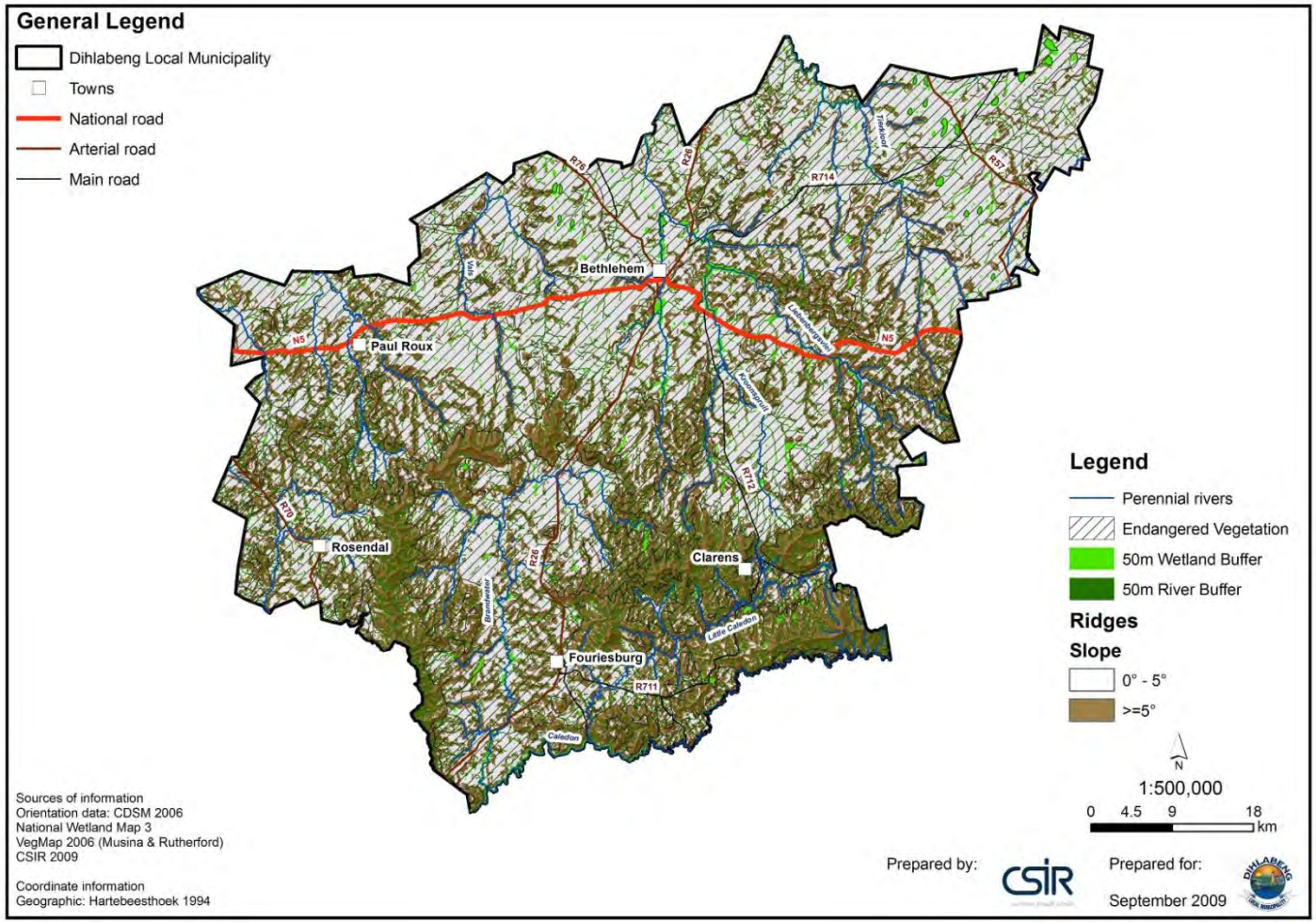

Figure 2.13: Sensitive areas in Dihlabeng Local Municipality

2.9.2 The Maloti-Drakensberg Transfrontier Conservation Area

Part of the Maloti-Drakensberg Transfrontier Conservation Area falls in the DLM. The Maloti-Drakensberg Transfrontier project, established in 2001 aims to conserve the biodiversity of South Africa and Lesotho and at the same time contribute to community development through income generation from nature-based tourism. The project comprises 8 113 km^2, made up of 5 170 km^2 (64%) in Lesotho and 2 943 km^2 (36%) in South Africa. It is a trans-boundary initiative that forms an important component of the Millennium Africa Recovery Programme (DEAT, 2001)

On the South African side, the project area extends from Clarens in DLM through the uKhahlamba-Drakensberg Park World Heritage Site and its surrounds through to Ongeluks Nek Nature Reserve in the Eastern Cape. It contains state protected areas such as Golden Gate Highlands National Park as well as extensive tracts of community and privately owned land. The area is a World Heritage Site and proposed Peace Park, which extends over some 5 000 km^2 and provides the opportunity for trans-boundary collaboration to strengthen ecosystem management and promote cooperation between two neighbouring countries (World, Bank 2002).

The project will ensure protected area planning for existing and proposed conservation areas through planning and zoning development, area management, and business planning. Management of conservation of existing protected areas, focusing on the control of alien invading plant species, and supporting through incremental costs, the rehabilitation of management roads, improvement of flora and fauna conservation, prioritizing on endangered species. The project will be planned to manage conservation of planned protected areas, prioritizing on the issue of overgrazing, and loss of wetlands. Community participation, emphasizing on targeted training in conservation, nature-based tourism and craft production are planned into the project. Overall, it is envisaged that nature-based tourism, emphasizing on community-focused capacity building, with the private sector providing managerial know-how, including capital for tourism development will be developed. All these are expected to strengthen institutional development, supporting the emergence of local boards through the establishment of a structural modus operandi, and capacity building in the management of protected areas (World Bank, 2008).

The conservation areas in DLM are shown in Figure 2.14.

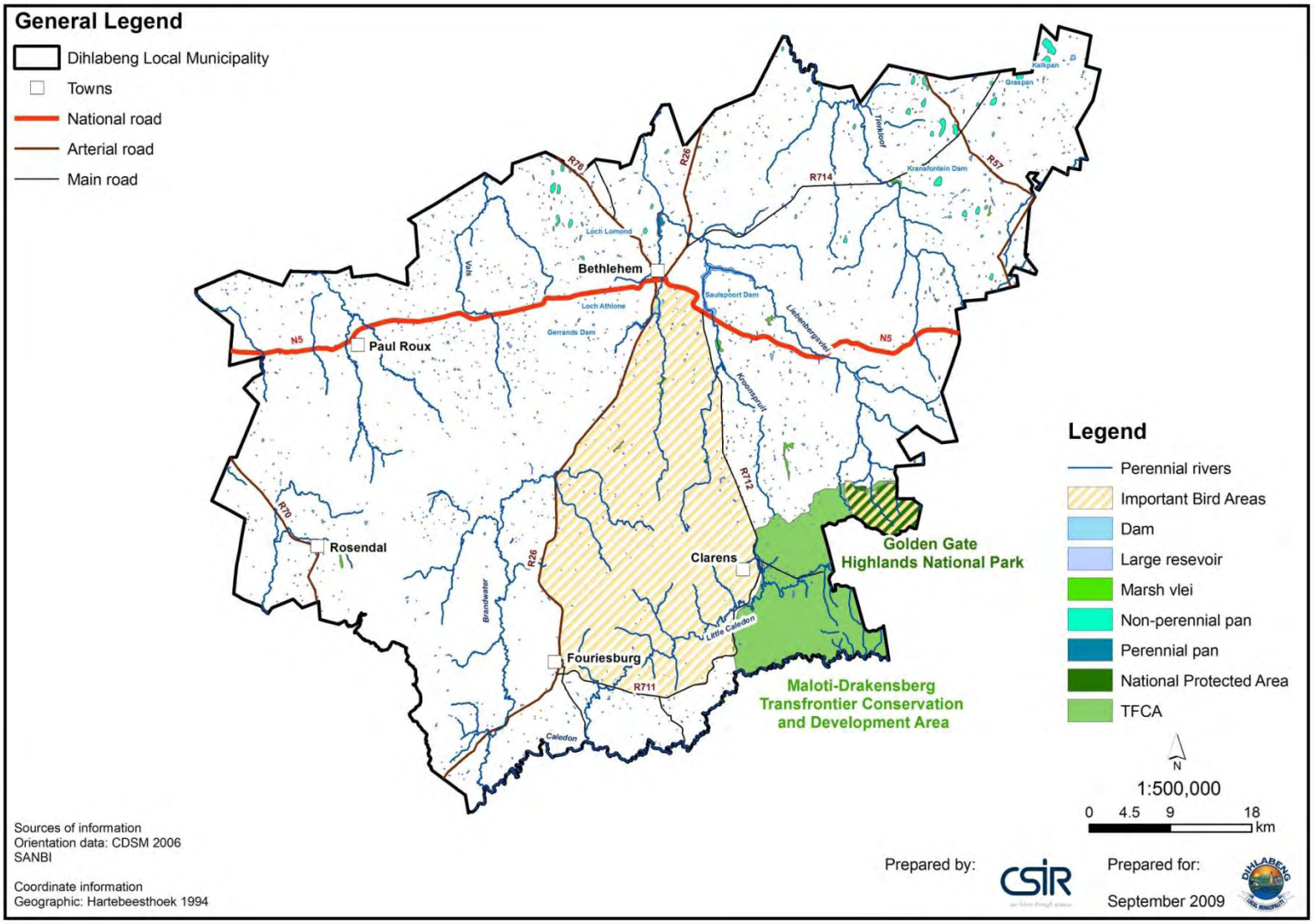

Figure 2.14: Conservation areas in Dihlabeng Local Municipality

2.10 Heritage

The cultural heritage of the Dihlabeng area has been shaped by the history of the area. The various heritage sites in DLM are shown in Table 6.

Table 6: Heritage sites in Dihlabeng Local Municipality

Bethlehem	**Clarens**	**Rosendale**	**Fouriesburg**	**Paul Roux**
Goble Park Memorial Gate	Clarens Formation Sandstone	Nkokomohi Caves	Anglo-Boer war sites	The Dinosaur Tracks in Uniondale
Staffords Hill	Mushroom rock		Snymanshoek	
Bird Cage Hill	Titanic rock		War graves	
English Cemetery	Surrender Hill		Dunblane	
Boer Cemetery				
Michael Prinsloo Memorial				
Gravestone of Japie Greyling				
Civic Centre and Town Hall				
Three Stones				
Monument at Dutch Reformed Church-				
Memorial plaque at Dutch Reformed Church				
Groenkop				
Retiefsnek				
Slabbertsnek				
Yeomany Hills				
Naudeskop				
Sol Plaatjie Dam				

Sources: Dihlabeng SDF (2008/2009); Free State Tourism (http://www.freestatetourism.org)

2.11 Air Pollution

There is no air quality monitoring in DLM. The DLM SDF (2008/2009) notes that smoke pollution mainly from cooking fires and veld fires creates a potential health hazard in the municipality. Due to the prevalence of agricultural activities which include tillage and crop spraying in the area, it is anticipated that airborne dust and agricultural chemicals could be a concern in the area.

2.12 Urban Edge

The urban edge represents the outer limits or boundary for urban development and is meant to discourage continuous urban sprawl and to promote integration and more compact urban areas. The DLM has a flexible position on the urban edge. The Dihlabeng Local Municipality SDF (2008/2009, p99) states that „the urban edge should not be considered as an exact line, but as a conceptual boundary to prevent further urban extension". Development pressures vary in the urban areas of Dihlabeng with centres such as Bethlehem experiencing more pressure than the smaller centres. Urban edge issues for the different urban areas in DLM (Dihlabeng Local Municipality SDF, 2008/2009) are as follows:

Bethlehem
The town has faced pressure for business development on the eastern side and the municipality has prohibited further development beyond designated points. Development of the urban area is to be stimulated in a westerly direction as provision for this has been made through the acquisition of smallholdings directly adjacent to the urban edge for incorporation into the urban area. The incorporation of these smallholdings into the urban area will follow prescribed development plans. Development in Bethlehem has to occur only in designated areas.

Clarens
The urban edge of Clarens is largely determined by the physical features of the area. Sandstone ridges surrounding the present urban area naturally form the urban edge. The integration of the larger Clarens urban area is complicated by the broken terrain. To the north-west, urban development is restricted by the Clarens Conservation Area. The proposed golf estate developments adjacent to Mount Horeb form the boundary of urban development in the northeast. On the southern side of the town, the extension of the residential area is designated as the furthest limit of urban development.

Paul Roux
Due to limited growth potential of the Central Business District (CBD), no specific direction for growth is indicated in Paul Roux although development should take place within the proposed development corridors. The boundary of the existing town forms the urban edge to the north and south. A sandstone ridge hinders further development to the west and east of the larger town area and forms a natural urban edge. The area to the north and east of the town cannot be developed further due to hilly terrain.

Fouriesburg
There is little development pressure due to the limited growth of business in Fouriesburg and therefore little pressure on the urban edge. There are designated development corridors in the town and development should take place in these corridors.

Rosendal
Although there is limited business growth in Rosendal, and very little pressure on the urban edge, there are designated business nodes in the town. The high density suburb of Mautse on the eastern side of the town is, however, expanding rapidly. The urban edge is determined by a prominent spruit on the north eastern side of Rosendal and to the east of Mautse.

2.13 Existing land use and socio-economic aspects

2.13.1 Agriculture

Most of the area of DLM has moderate potential for agriculture (Figure 2.15), with low potential areas being largely concentrated in the northern part of the municipality. A small part of the municipality is not suitable for agriculture. Low potential agricultural areas also occur around Rosendal and Clarens.

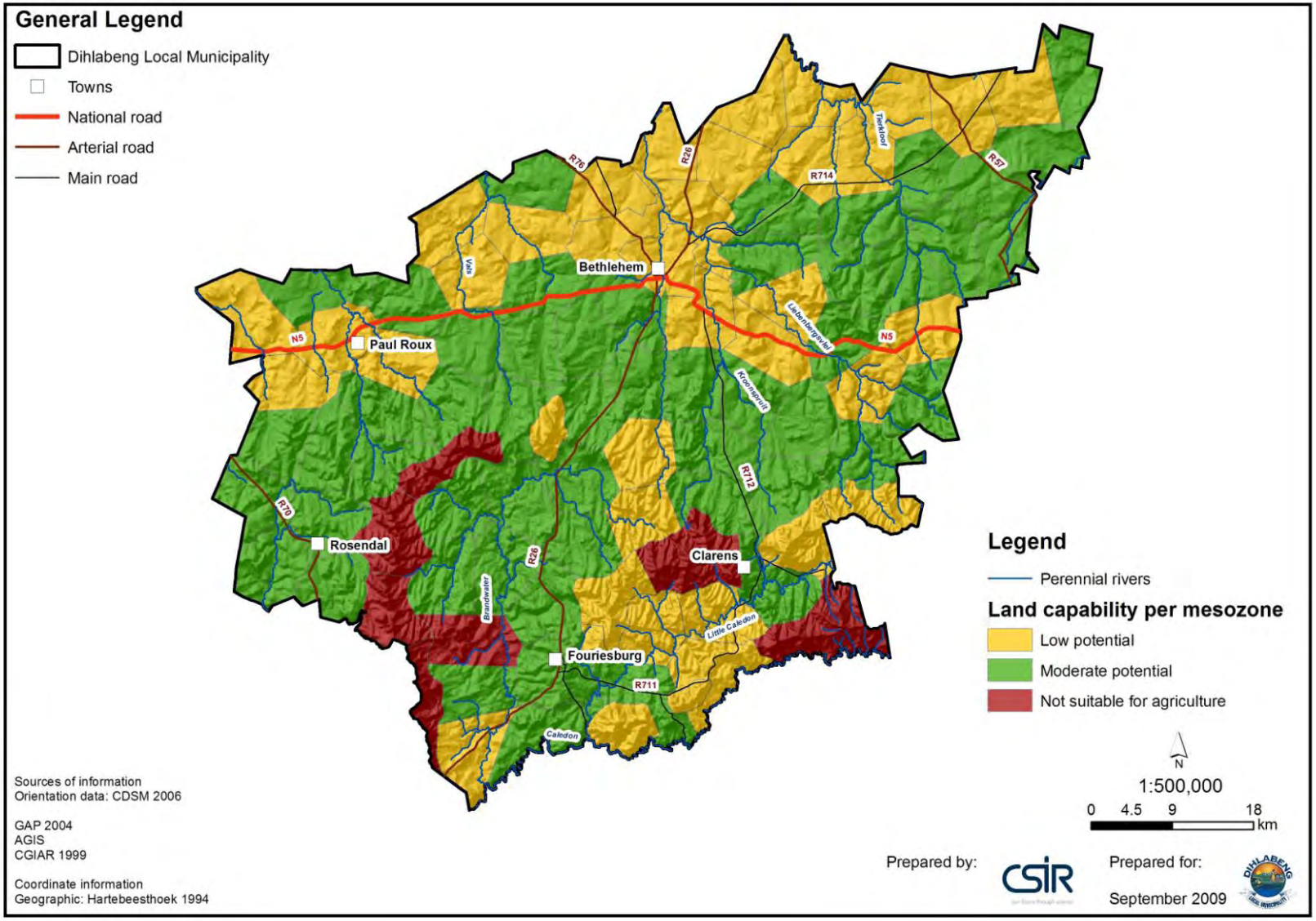

Figure 2.15: Land capability in Dihlabeng Local Municipality

The key economic activity in DLM is agriculture, which is diverse and includes the production of various crops, fruit and livestock. Most of the agricultural land in Dihlabeng is utilised for livestock grazing (Table 7), and cultivated land accounts for 44% of the agricultural area. The main crops grown are maize, wheat, sorghum, soyabeans and sunflowers (Figure 2.16). Apples, cherries, peaches, asparagus, potatoes, cut flowers and a variety of other horticultural crops as well as dairy products are also produced. Cultivation is concentrated mainly in the northern and central parts of the municipality. Both summer and winter crops are cultivated and irrigation is used Areas of high cultivation of winter crops are concentrated in the northern and central parts of the municipality (Figure 2.17).

Table 7: Use of agricultural land in the Dihlabeng Local Municipality.

Land Utilization	**Total area**	
	Hectares	% of area
Unavailable for agriculture	22696	3
Presently under cultivation	210247	44
Available for cultivation	13849	2
Presently under grazing	239958	51
Total area	486700	100

Source: Dihlabeng IDP Analysis (2009/2010)

Stock farming in the municipal area is extensive, focusing mainly on natural grazing and dairy farming, mainly in the Bethlehem area. According to the Dihlabeng IDP Analysis (2009/2010) page 105, the Dihlabeng region is developed to its optimum with regard to agriculture and future development of this sector is thus not foreseen.

The total number of farms in the Dihlabeng municipal area, based on the Demarcation Board (2002) data (Dihlabeng IDP Analysis, 2009/2010) is 726 with a total of approximately 9272 people employed in the farming sector. Many of the farms are changing to game farming and provision of recreational facilities. Subdivision of agricultural land to provide tourism and recreation facilities has mainly been applied to riparian properties with a minimum water front of 100 m (Dihlabeng IDP Analysis, 2009/2010). Uncontrolled conversion of agricultural land to recreational use could compromise the country"s food security as the Free State is one of the key food producing areas of South Africa. In addition to commercial farming and tourism, agriculture in DLM also includes small scale farming. Some farms have been identified to be acquired with funds granted by the Department of Land Affairs in collaboration with the Department of Agriculture to be used as commonage for the purpose of communal grazing and small scale farming purposes (Dihlabeng IDP Analysis, 2009/2010).

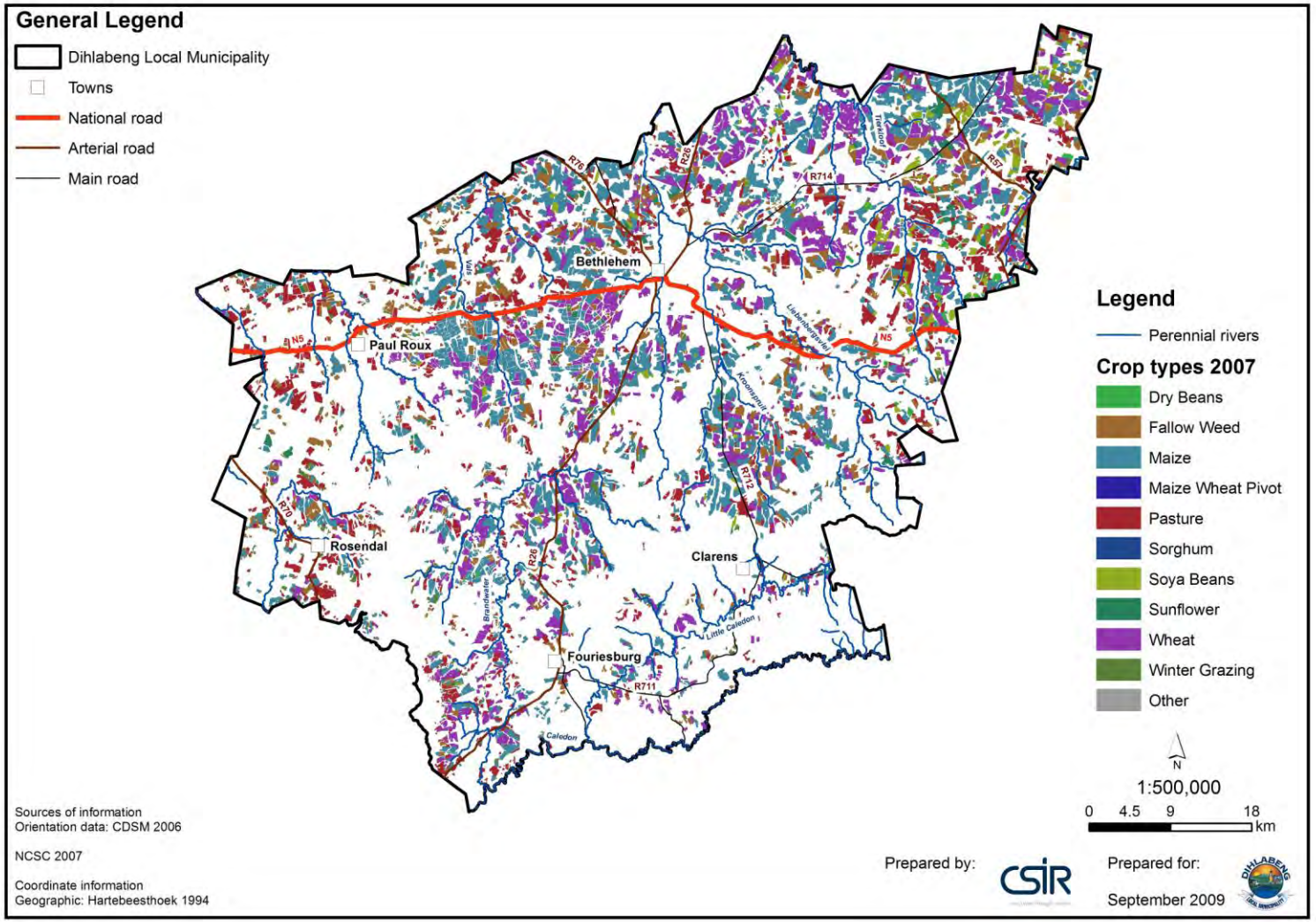

Figure 2.16: Crop types in Dihlabeng Local Municipality (2007)

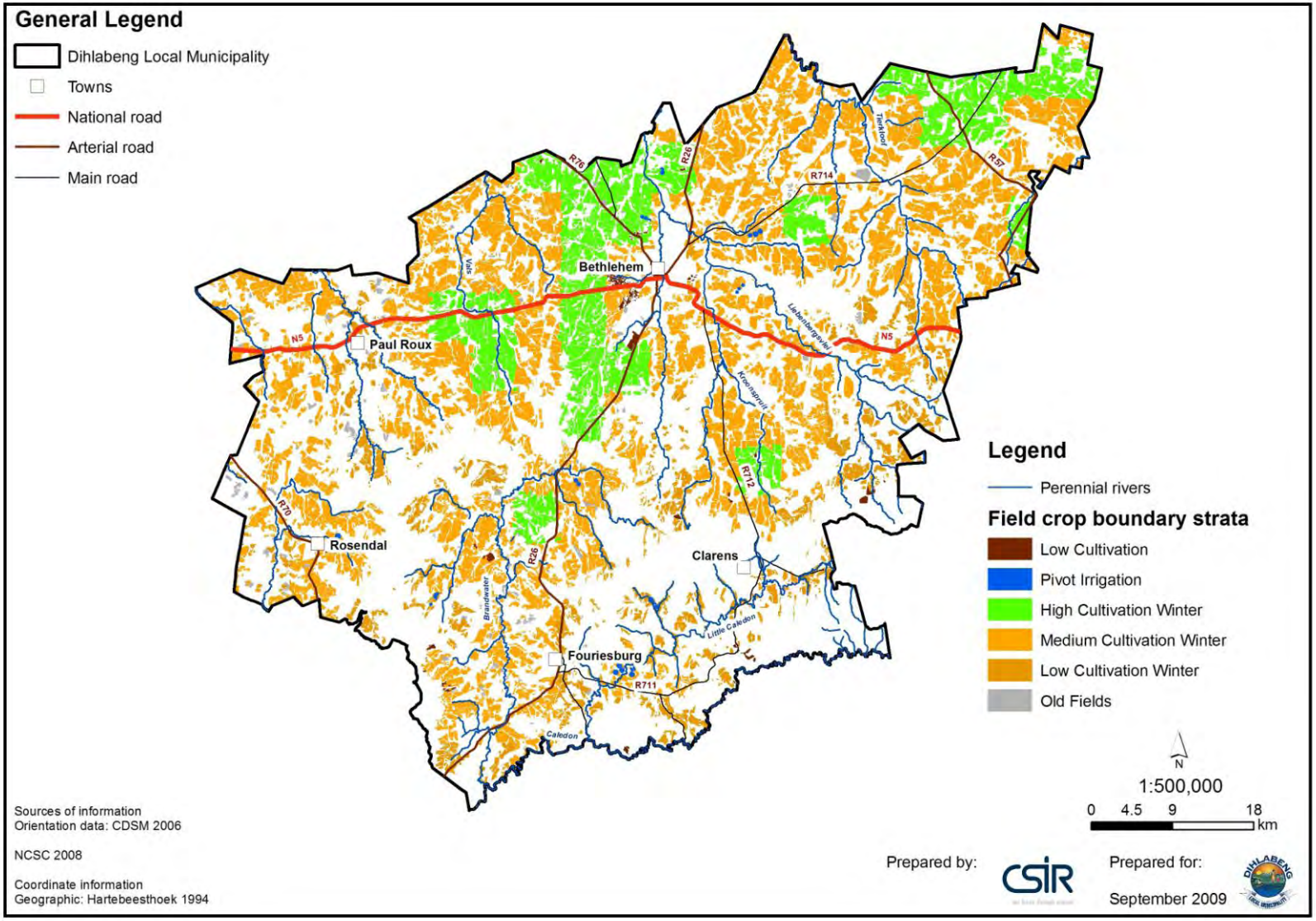

Figure 2.17: Field crop boundaries in Dihlabeng Local Municipality

2.13.2 Tourism

The Dihlabeng area is considered a prime tourist destination (Dihlabeng IDP Integrated Environmental Programme, 2006/2007) due to the scenery and recreational facilities available in the area. Tourism growth is one of the listed priorities within the IDP priority issues. One of the objectives of tourism growth is to exploit and develop the tourism potential in all the towns in the area (Dihlabeng IDP Strategic Planning, 2009/2010). Recreation areas and facilities are located throughout the Dihlabeng region. The area is increasing in popularity as a scenic destination and hosts a range of nature and culturally oriented activities which are categorised into primary and secondary attractions (Table 8). The primary attractions in DLM provide the major reasons for tourists visiting the area. Secondary attractions have tourist appeal but are not the primary reason for visiting. Some of the popular tourist areas are the Clarens rural area and the Golden Gate National Park. There is potential for tourism in the Rosendal area due to a variety of natural sites such as dams, a mountain range, hiking trails and rich bird life in the area (Dihlabeng IDP Regional Analysis, 2007/2008). The expansion of tourism is being planned for and there is sub-division and development of several farms for holiday, tourism and permanent residential purposes in Clarens. The subdivision of farmland to provide tourism and recreation facilities has enhanced the economic base of the rural areas of DLM and added value to agricultural properties (Dihlabeng IDP Analysis, 2009/2010).

Table 8: Tourist Attractions in Dihlabeng Local Municipality.

Category	**Example**
Primary Attractions	• Golden Gate nature reserve (National Park) • Wolhuterskop Nature Reserve • Private Nature Reserve at Clarens and various other bavarias and conservancies
	Witsieshoek/Sentinel
	The pristine scenic environment in Rosendal, Fouriesburg and Paul Roux;
	Saulspoort Dam, Loch Lomond and Loch Athlone in the Bethlehem vicinity
	Lions Rock Big Cat Sanctuary
	Memel/Seekoeivlei Wetlands (Birding)
	Basotho Cultural Village
	San art features (9 promoted)
	Lesotho Highlands water Scheme and Ash River Outfall
Secondary Attractions	Picturesque hiking
	Hiking trails along the Maluti Range
	Clarens Art/Craft hub
	The Batlokoa people
	Historic sites (museums and conflict sites)
	Hiking and horse trails)
	Fly fishing
	4 x 4 Trails
	Game viewing
	Arts and craft sites
	Cultural and heritage sites e.g. Salpeter Motoulong Caves (Clarens), Bodimong (Rosendal) and Wolwehoek (Paul Roux).
	Historically important sites such as the battlefield of Groenkop to the east of Bethlehem and Surrender Hill to the south west of Clarens and the Noupoortsnek battlefield
	The annual South African national hot air balloon championships
	Bethlehem Hydro Project

Golf is a growing tourist attraction in DLM. There are golf estates in various stages of development in Clarens, and midway between Fouriesburg and Clarens on the Caledon River side (Dihlabeng IDP Regional Analysis, 2007/2008). These proposed golf estates are situated in either rural and/or economically depressed areas and serve as economic growth generators in these areas.

2.13.3 Mining

Mining is a minor activity in DLM and only contributes about 8% of the Gross Geographical Product of the area (Dihlabeng IDP Analysis, 2009/2010). Mining in DLM is mainly comprised of surface based activities (Figure 2.18), with the main mining activities in the area being:

- Gravel mining in the Wolhuterskop Nature Reserve and Gerrands Dam Nature Reserve;
- Sandstone cutting within the vicinity of the Clarens and Fouriesburg town area;
- Vast sandstone formations in the Fouriesburg town area which hold mining potential;
- Numerous private mining activities, mostly relating to gravel exploitation and sandstone cutting.

Mining activities are subject to Environmental Management Programmes in terms of the Minerals and Petroleum Development Act (Act No 28 of 2002) and the Mines and Works Act (Act No. 17 of 1956) (Dihlabeng SDF, 2008/2009). Due to the prevalence of fossils in Dihlabeng, EIAs that also address impacts on fossils are required before mining operations. The rehabilitation of old quarries and mine excavations is an environmental concern in DLM as the excavations are a hazard to people and animals.

2.13.4 Key economic activities in the different regions of Dihlabeng

Greater Bethlehem serves as the commercial hub for the surrounding agricultural area. It is an accumulation, marketing and distribution point for various products in the region. Tourism is also important in Bethlehem due to the strategic location of the urban area and surrounding natural environment. Angling in the Saulspoort, Loch Lomond and Loch Athlone dams in the vicinity of Bethlehem is a tourist attraction in Bethlehem. Clarens is a nationally distinguished holiday destination and tourism is the primary economic sector in the town (Dihlabeng IDP Analysis, 2009/2010). In Paul Roux agriculture is the primary economic sector. The Fouriesburg district is a highly productive agricultural region. Fruit farming is an important sector, with most of the fruit being processed and packed on the farms and then distributed. Trade and industry in Fouriesburg are confined to the provision of services for the agricultural sector. These services include retail, agricultural suppliers and support services and government services. Tourism is also important in Fouriesburg and tourist attractions include the Meiringskloof Dam, hiking and 4x4 trails and the Golden Gate Nature Reserve. The main sectors in the Rosendal area are agriculture, trade, government services and financial services. The main contributing sectors to provincial production are agriculture, trade and finance.

2.13.5 Housing

Most of the households in DLM (63%) live in formal houses, while 24% live in informal houses and 12% in traditional dwellings (Dihlabeng SDF, 2008/2009). Based on 2007 estimates, the number of housing units required in DLM is 5715 (Dihlabeng IDP Analysis, 2009/2010). Most of the housing is required in Bethlehem (Table 9). Demand for housing is especially high in Bethlehem"s high density suburb of Bohlokong. Although land for current housing development in Bohlokong is available, provision has to be made for land for future housing development.

Table 9: Housing needs in the Dihlabeng Local Municipality.

Area	**Housing units required**
Bethlehem	2494
Clarens	287
Paul Roux	853
Rosendal	1674
Fouriesburg	407
TOTAL	**5715**

Source: Dihlabeng IDP Analysis (2009/2010)

The predominant type of housing in DLM is the individual dwelling (free standing) (Figure 2.19).

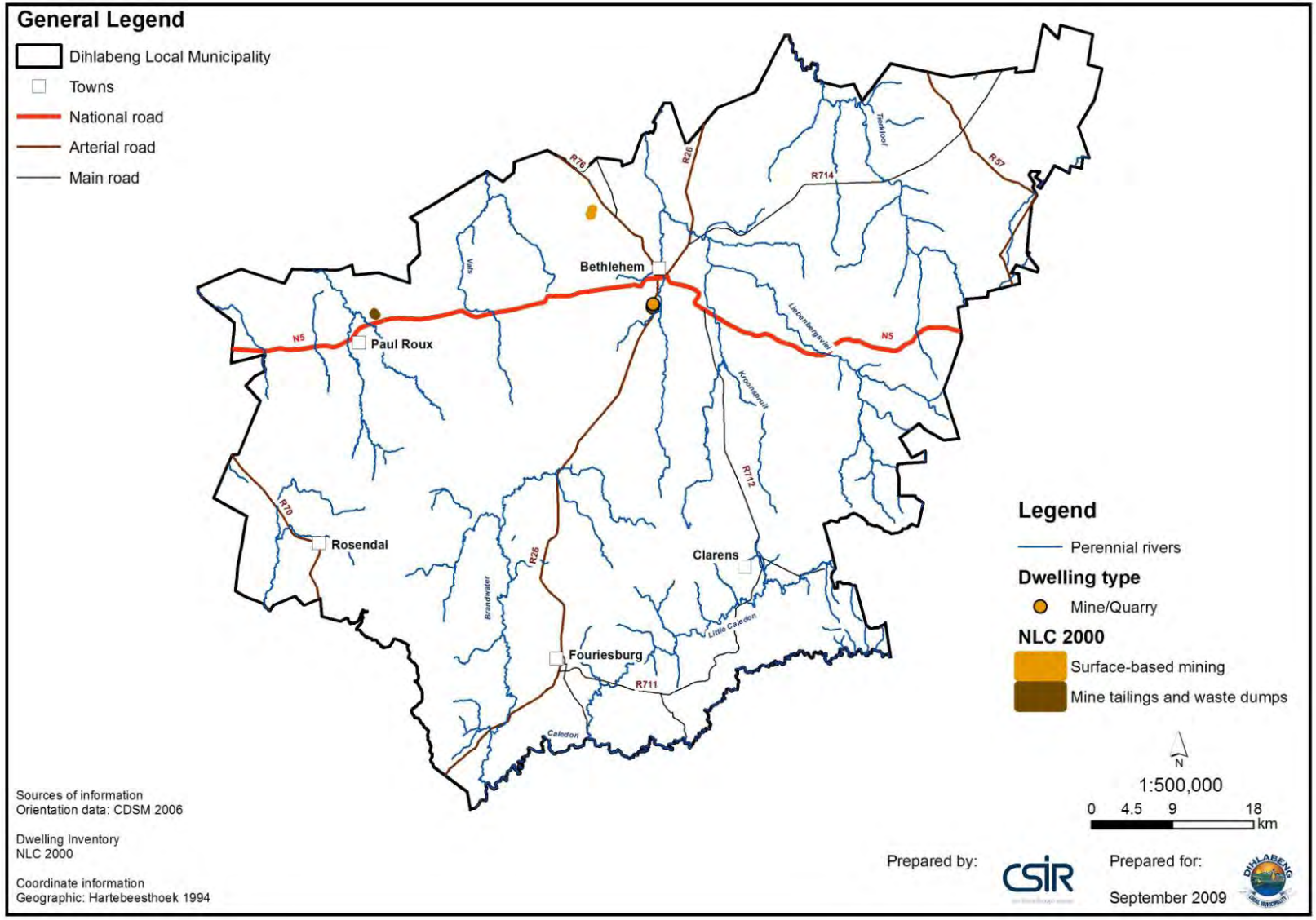

Figure 2.18: Mining activities in Dihlabeng Local Municipality

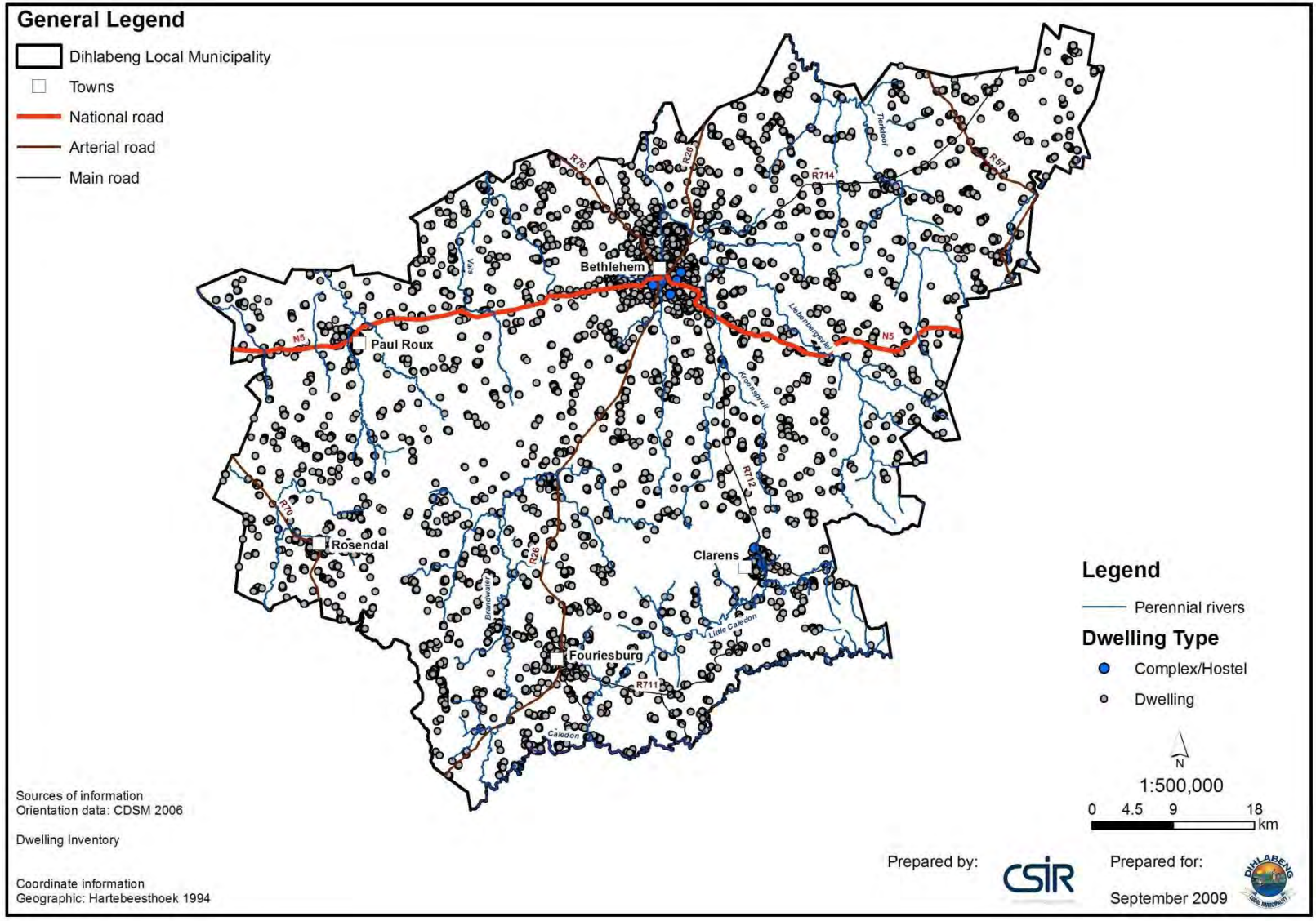

Figure 2.19: Dwelling types in Dihlabeng Local Municipality

2.13.6 Open Spaces

The open space system in DLM revolves around the protection and conservation of ecologically sensitive areas. Identified open spaces in the town of Bethlehem are protected from development and include all land adjacent to rivers, wetlands, certain ridges and koppies. The dams around Bethlehem are part of the town"s open space system. To the north of the town is the Loch Lomond Dam; to the east is the Saulspoort while the Loch Athlone Dam is on the southern side of the town. Given the location of these dams, development in Bethlehem is planned for the western side of the town. There are, however, opportunities for residential and recreational development at the Loch Athlone and Saulspoort Dams. The municipality supports development in these areas, but subject to rigorous Environmental Impact Assessments.

In Clarens, open spaces are made up of vacant town land, the Rooiberg mountain range and streams of the Klein Caledon River which run through the town. The Clarens Nature Reserve forms part of the open space system together with four wetland areas which are in the town. In Paul Roux, open spaces have been purposely provided in accordance with modern urban planning principles (Dihlabeng SDF, 2008/2009). While there are no formal conservation areas in Paul Roux, the Sand River which runs through the town is part of the open space system.

The Meiringskloof Holiday Resort in Fouriesburg with its hiking, mountain biking horse riding, bird watching and angling facilities dominates the open space system in the town. Sports fields in Fouriesburg are also part of the open space system. In Rosendal, apart from parks, open spaces are found outside the developed area and consist of mountains and streams.

2.14 Infastructure

2.14.1 Transport

Roads

The N5 is the only national road traversing the Dihlabeng Local Municipality and it links Bethlehem and Paul Roux. There are eight regional roads running through the municipality, namely the R70, PR, R712, R711, R26, R76 , R57 and the R714 (Figure 2.19). There is also a network of secondary roads in the area.

Rail

There is a north-south railway line running through Dihlabeng Municipality. It links Bethlehem with towns outside Dihlabeng such as Valsrivier and Kransfontein. The main railway line between the North-West Province via Kroonstad and KwaZulu-Natal extends through the area. Dihlabeng is also linked to the Gauteng and the Cape Provinces through a railway line which runs through the municipality, linking it to the towns of Reitz and Bloemfontein. According to the Dihlabeng IDP Analysis (2009/2010), the existing railway line in Bethlehem has adequate capacity to serve the area over the short and medium term.

Airfields

There is one airfield and several landing strips within the municipality (Figure 2.20). The landing strips are owned by farmers and other individuals for private use. Bethlehem has an airport. The Bethlehem airport is usually mainly used by crop spraying aircraft. It was indicated in the 1991 Structure Plan and 1995 Framework Plan that the current position of the airport is not desirable, but suitable for use in the short to medium term. An alternative site was identified in the 1995 Framework Plan (Dihlabeng IDP Analysis, 2009/2010).

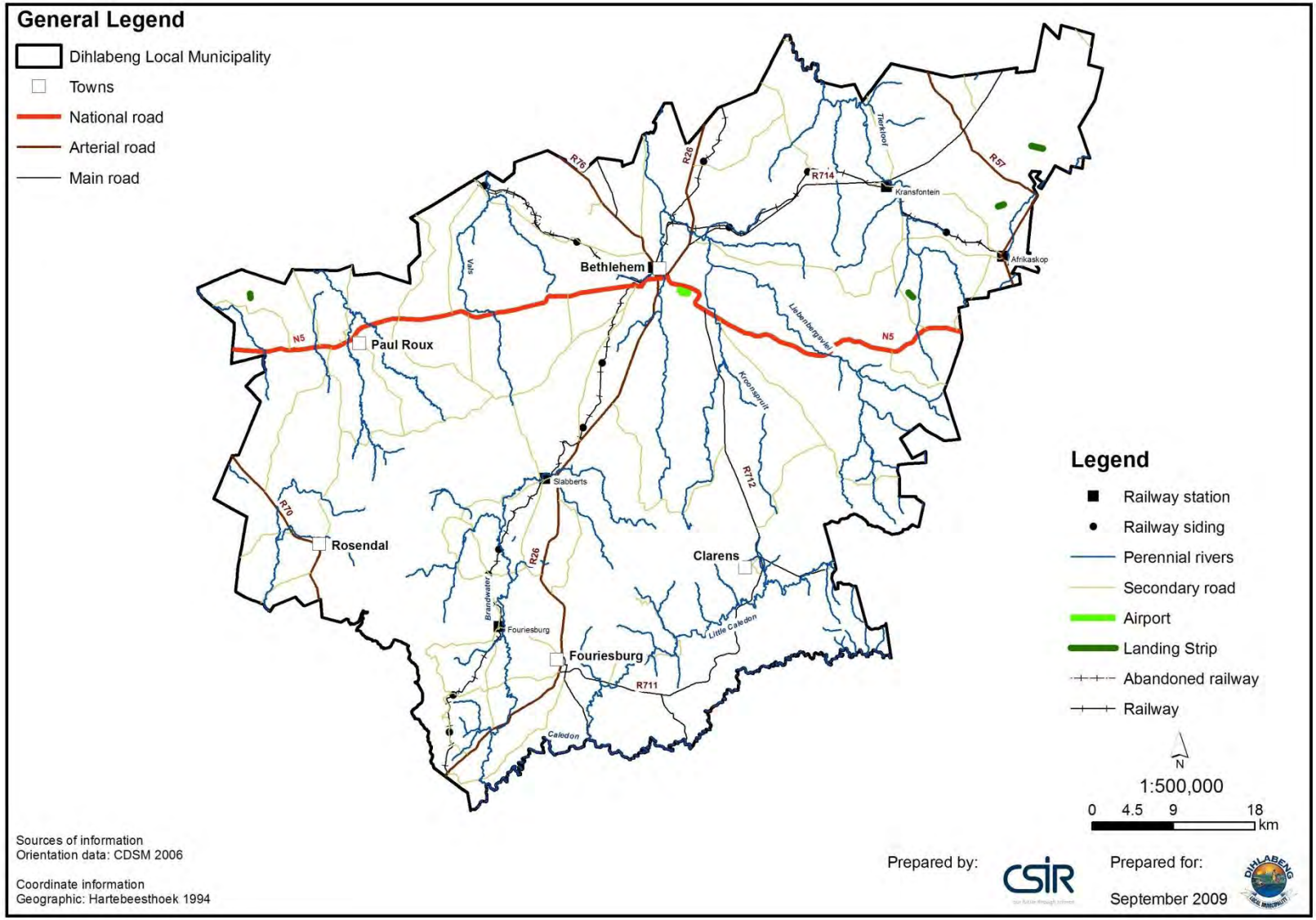

Figure 2.20: Transport infrastructure in Dihlabeng Local Municipality.

2.14.2 Bulk services

Water and Sanitation

According to a 2007 community survey reported in the Dihlabeng IDP Analysis (2009/2010), over three quarters of the households in DLM have access to flush toilets. The bucket system is still being used by nearly 10% of the households in DLM while just over 3% of the households have no access to any sanitation facilities (Table 10).

Table 10: Provision of sanitation facilities in Dihlabeng Local Municipality

Sanitation facility	**% of households with facility**
Flush toilet connected to sewerage	74.7
Flush toilet with septic tank	1.9
Dry toilet	1.0
Chemical toilet	0.2
Pit latrine with ventilation	0.8
Pit latrine without ventilation	8.6
Bucket latrine	9.6
None	3.2
Total	**100**

Source: Dihlabeng IDP Analysis (2009/2010)

Refuse removal

Each of the five towns in DLM has a municipal refuse dumping site. Nearly two thirds (65%) of the residents of DLM have access to municipal refuse services (Dihlabeng SDF, 2008/2009). At present DLM does not have a high hazardous waste disposal site. A Health Care Risk Waste Policy developed in 2002 to take care of medical waste in the Free State has not been implemented due to problems of compliance with various environmental guidelines.

Water provision

Approximately 74% of households in DLM have access either to a water connection in the house (25%) or to a water connection inside the yard (49%). Another 12% of the households get their water from a community stand within 200 m of their dwellings and 9% from a community stand further than 200 m from their dwelling (Dihlabeng SDF, 2008/2009).

2.15 Social Factors

2.15.1 Population profile

The total population of DLM is 140 919 persons consisting of approximately 33 026 households, with an average density of 3.9 persons per household (Dihlabeng Integrated Development Plan, 2008/2011). The population of DLM is mainly concentrated in the urban areas of Bethlehem, Paul Roux, Fouriesburg, Rosendal, and Clarens (Figure 2.21). The highest population density is in the Bethlehem area. Population density ranges from 0 to 7 persons per square kilometre in rural areas to over 1 300 persons per square kilometre in Bethlehem (Figure 2.22). Urban areas like Bethlehem have experienced rapid population growth (nearly 7% per annum in some areas of the city) while population growth in smaller centres such as Clarens is 1% per annum (Dihlabeng SDF, 2008/2009). Population growth in the urban areas of Dihlabeng has mainly been due to in migration of people from rural areas.

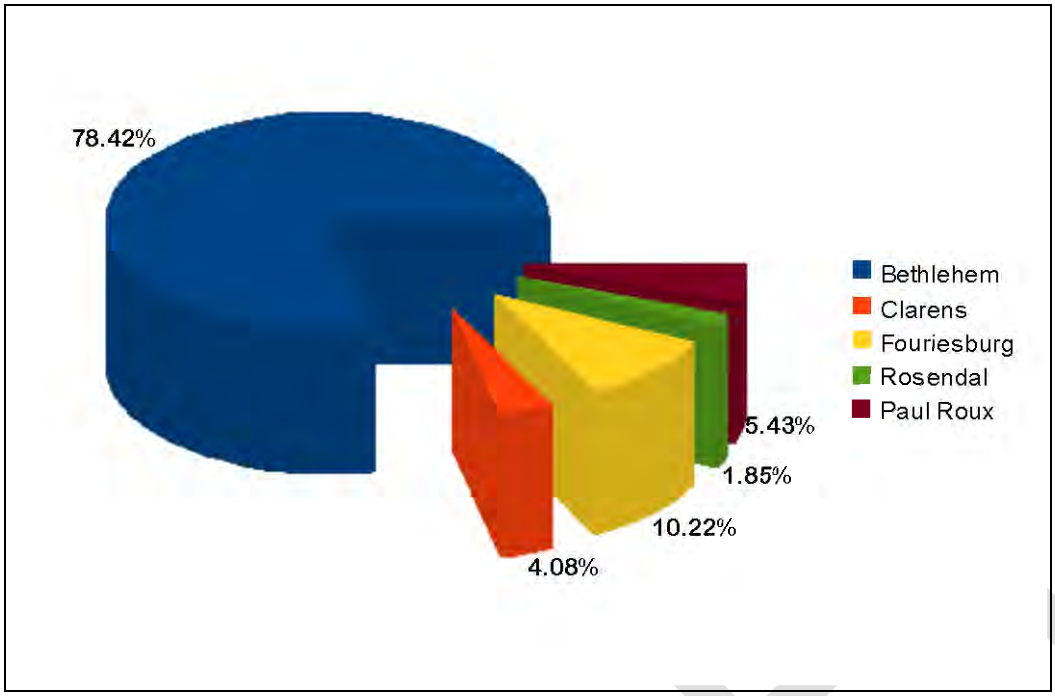

Figure 2.21: Population distribution in Dihlabeng Local Municipality

Source of data: Dihlabeng IDP Regional Analysis (2007/2008).

2.15.2 Economic contribution

Local Economic Development (LED) is listed as the second priority after infrastructure development on the list of identified IDP priority issues for DLM (Dihlabeng IDP Strategic Planning, 2009/2010). The listed objectives of the LED are broadening the economic base of Dihlabeng and creating employment for the people of Dihlabeng and promoting viable local economic opportunities. Economic resources within the DLM area should thus be viewed within the context of fostering new opportunities for people in order to promote broad based economic growth, improving social welfare and promoting a more varied and vibrant local economy. Several strategies, a number of them based on making land available for the various economic activities are also in place (Dihlabeng IDP Strategic Planning, 2009/2010)

The dominant economic sectors in DLM are agriculture, trade and commerce (Table 11). These sectors contribute most of the Gross Geographic Product of Dihlabeng. Although the contribution of tourism is not indicated in available records, tourism is increasing in importance in Dihlabeng (Dihlabeng SDF, 2008/2009).

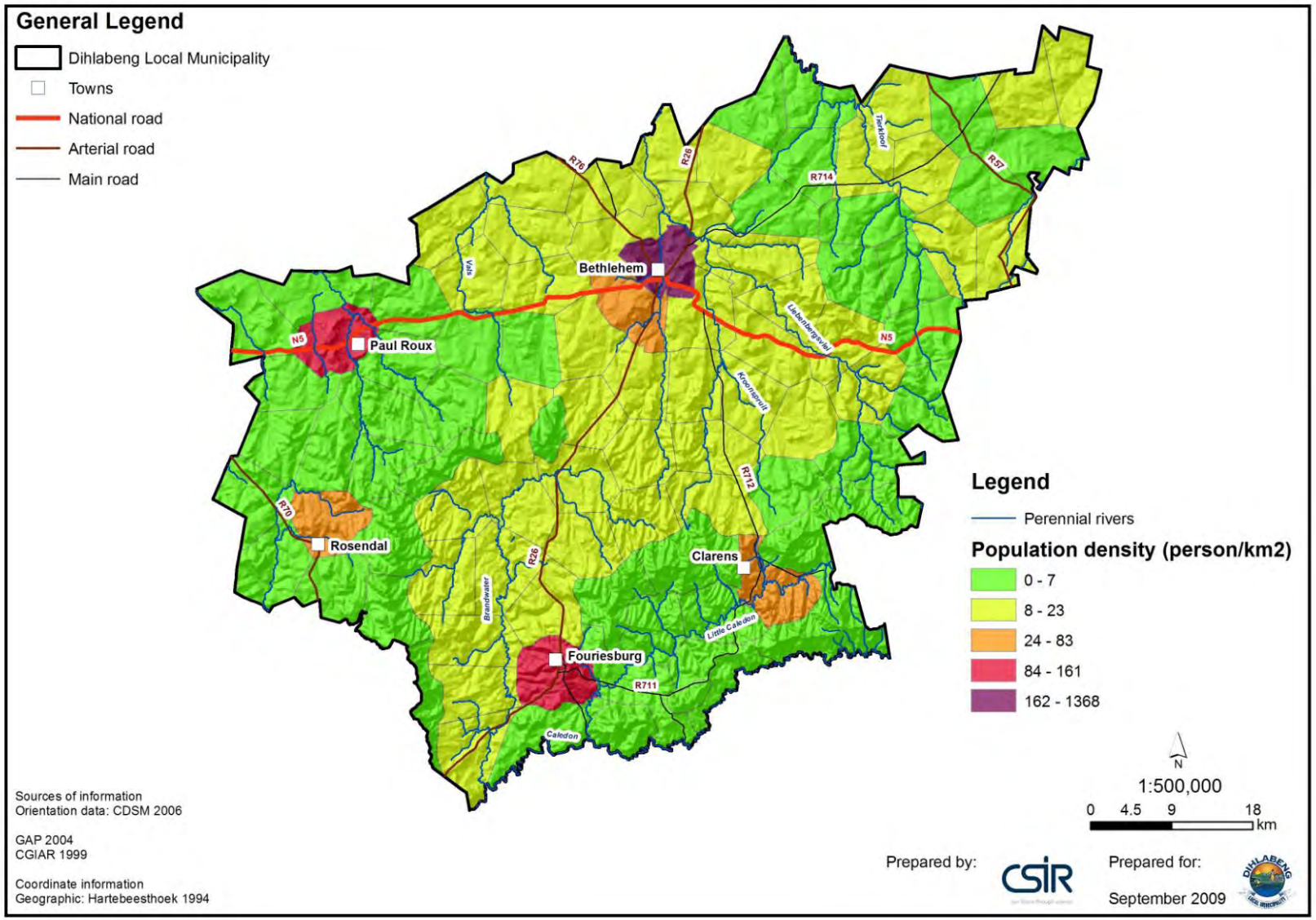

Figure 2.22: Population density in Dihlabeng Local Municipality

Table 11: Contribution of different sectors to the Gross Geographic Product of Dihlabeng Local Municipality.

Sector	Contribution (Rand)				
	Bethlehem District including Clarens	**Senekal district including Paul Roux**	**Ficksburg district including Rosendal**	**Fouriesburg District**	**TOTAL**
Agriculture, Forestry, Fishing	132 949 000	73 612 000	49 738 000	23 581 000	**279 880 000**
Mining and Quarrying	94 191 000	111 000	0	12 000	**94 314 000**
Manufacturing	28 911 000	36 115 000	8 835 000	1 706 000	**75 567 000**
Electricity, Water	29 701 000	1 952 000	3 770 000	141 000	**35 564 000**
Construction	145 858 000	813 000	1 956 000	0	**148 627 000**
Trade, Catering	101 840 000	31 091 000	59 676 000	3 615 000	**196 222 000**
Transport, Communication	147 970 000	4 426 000	13 044 000	3 060 000	**168 500 000**
Finance, Real Estate	12 996 000	18 827 000	81 752 000	2 410 000	**115 985 000**
Community Services	36 714 000	2 952 000	31 817 000	321 000	**71 804 000**

Source: Dihlabeng IDP Regional Analysis (2009/2010).

2.15.3 Employment

Just over 29% of the economically active population in DLM is unemployed (Dihlabeng IDP Regional Analysis 2007/2008). The number of people employed in the different sectors in DLM is shown in Table 12. The agricultural sector employs the majority of people in DLM.

Table 12: Number of people (age 15 to 65 years) employed in different sectors in Dihlabeng Local Municipality.

Sector	Total number of people employed
Agriculture, hunting, forestry, fishing	9 438
Mining, Quarrying	72
Manufacturing	1 522
Electricity, gas, water	149
Construction	1 046
Trade, repairs, hotels restaurants	4 071
Transport and Communication	883
Finance, real estate & business services	1 648
Community Services	5 320
Private households	4 325
Undetermined	2 362
TOTAL	30 836

Source: Statistics South Africa (2001).

Over half of the individuals in Dihlabeng Local Municipality do not earn an income (Table 13). Most of those that have an income earn less R12 000 per annum.

Table 13: Number of people per income category in Dihlabeng Local Municipality

Annual individual income	Number of individuals
None	60 867
R1-2400	7 436
R2401-6000	13 676
R6001-12000	5 570
R12001-18000	3 250
R18001-30000	2 987
R30001-42000	1 952
R42001-54000	1 323
R54001-72000	1 081
R72001-96000	557
R96001-132000	343
R132001-192000	215
R192001-360000	87
Over R360000	67

Source: Dihlabeng IDP Analysis (2009/2010).

2.15.4 Education

There are 115 schools in DLM. Ninety one of these are primary schools, 10 are secondary schools, seven are combined schools and seven are intermediate schools. Seventy eight of the schools in DLM are farm schools and are located in rural areas. Farm schools are distributed fairly evenly in the DLM (Figure 2.23) and they are mostly primary schools. Secondary schools are only found in the urban parts of the municipality. Schools in Dihlabeng cater for a population of nearly 30 000 pupils (Dihlabeng IDP Analysis, 2009/2010). Many farm schools in the Free State including DLM are reported to be closing down due to a decline in the number of pupils. Since 1996, the number of pupils in rural schools in the Free State has declined by about 43%. The decline has been attributed to urbanization and the impacts of HIV/AIDS (Dihlabeng IDP Analysis, 2009/2010).

2.15.5 Health

There is one regional hospital and one district hospital in the Greater Bethlehem urban area (Dihlabeng IDP Analysis, 2009/2010). There are also two private hospitals in Bethlehem. These hospitals serve the entire Dihlabeng municipality as there are no hospitals in Clarens, Paul Roux, Fouriesburg and Rosendal. There are clinics in each of the five towns in DLM (Table 14). Health facilities in Dihlabeng are concentrated in the urban centres (Figure 2.24) and provision of health services is poor in the rural areas. Health services are normally provided on a monthly basis in the rural areas through mobile clinics which provide services at different visiting points.

Table 14: Health facility provision in Dihlabeng Local Municipality

Type of facility	Bethlehem	Clarens	Paul Roux	Fouriesburg	Rosendal
Public hospitals	Bethlehem Regional Hospital- 150 beds, Operation Theatre present Phekolong District Hospital -100 beds, Operation Theatre present	None	None	None	None
Private hospitals	2	None	None	None	None
Fixed clinics	4	1	2	1	1
Community Health Centres	None	None	None	None	None
Mobile Clinics	2 vehicles	1 vehicle	None – Served by Senekal mobile clinics (non DLM)	1 vehicle	None – Served by Bethlehem mobile clinics
Visiting Points (1 visit per 4 weeks)	16	7	-	14	Unknown

Source: Dihlabeng SDF (2008/2009); Dihlabeng IDP Analysis (2009/2010).

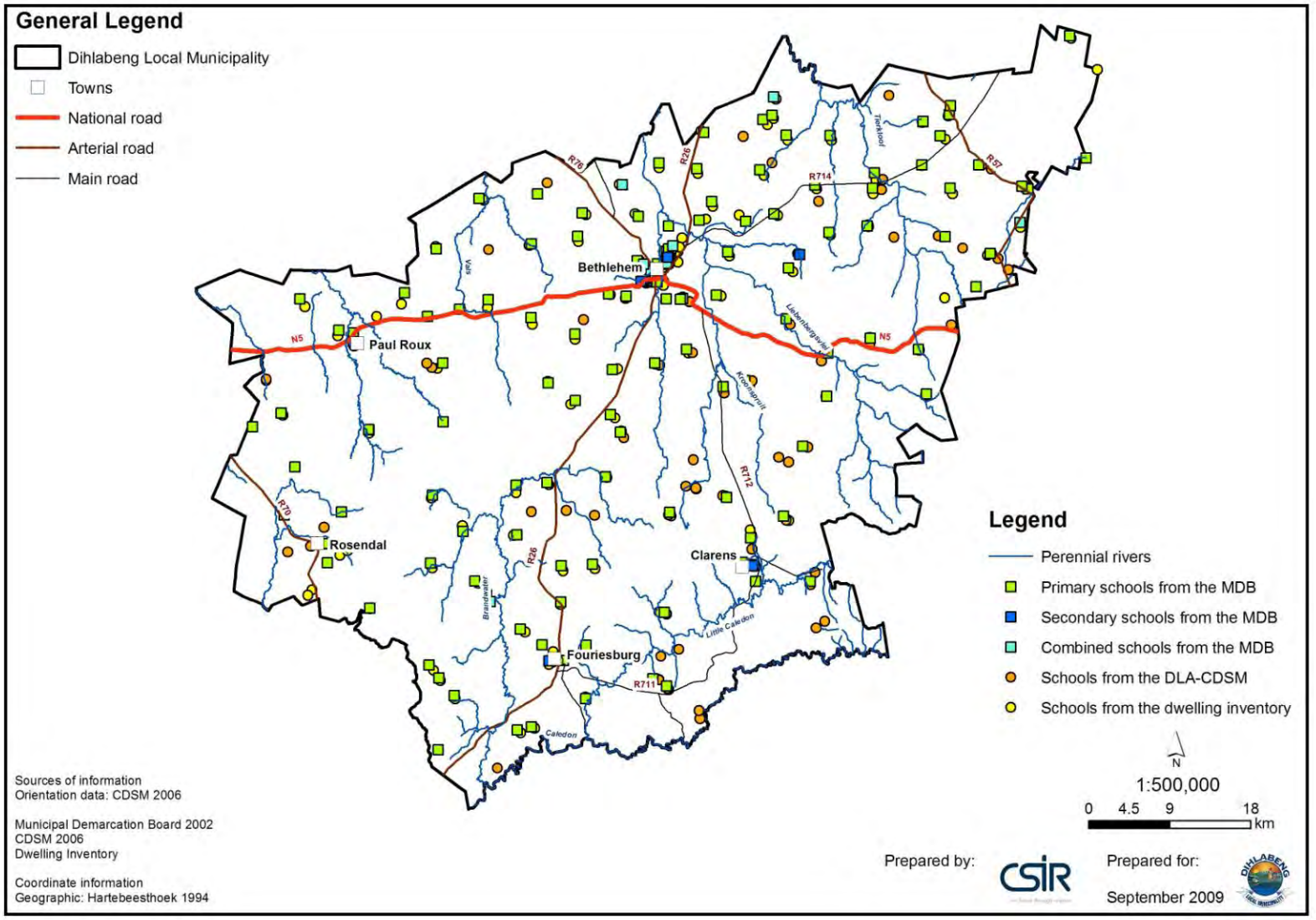

Figure 2.23 Educational facilities in Dihlabeng Local Municipality

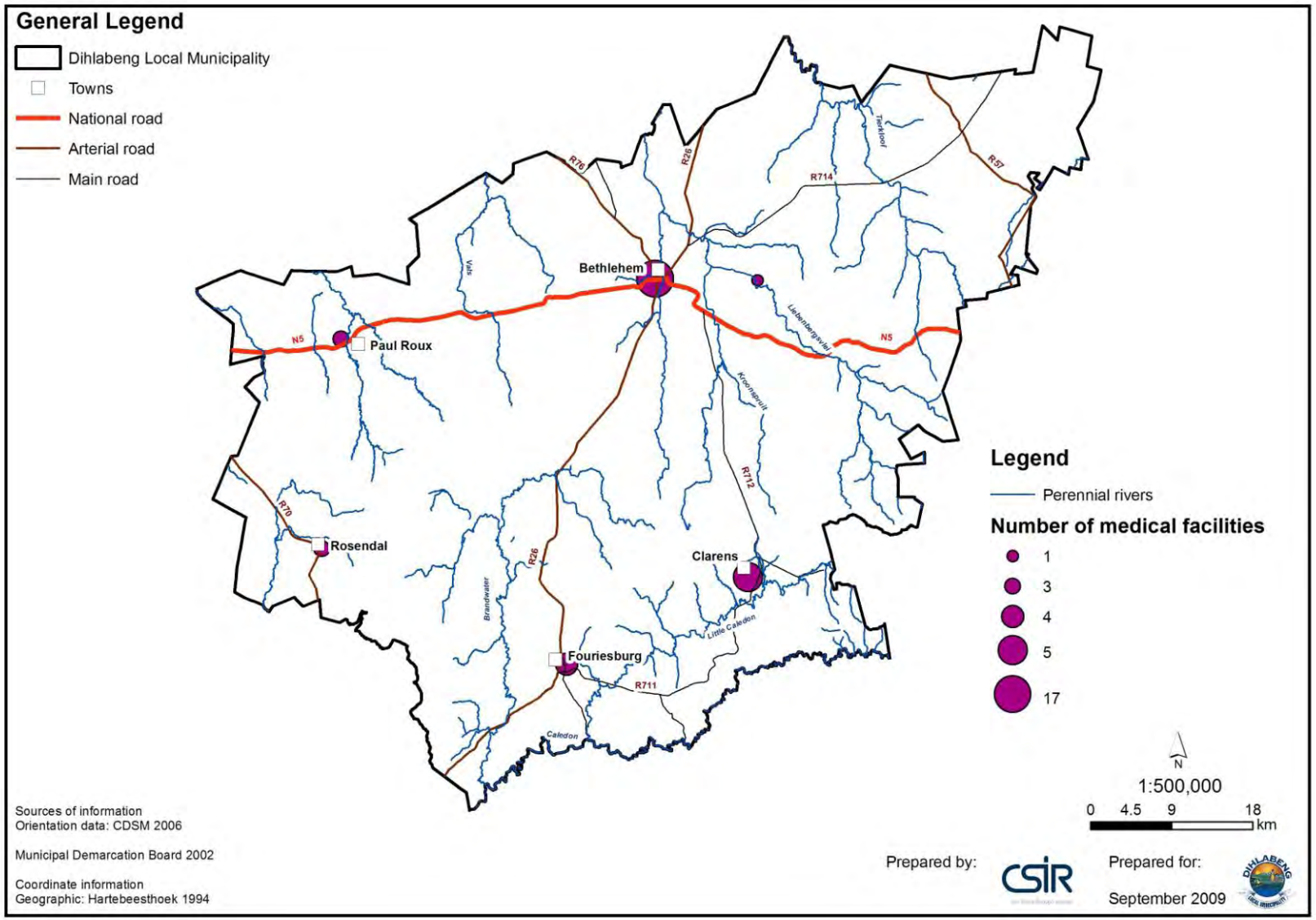

Figure 2.24 Health facilities in Dihlabeng Local Municipality

2.15.6 Safety and security

According to the Dihlabeng IDP Analysis (2009/2010), police stations are well provided in the urban areas of the municipality. A need has been identified for satellite police stations and mobile stations in the rural areas of the municipality.

3. ADMINISTRATIVE AND POLICY REQUIREMENTS

The purpose of this section is to provide an overview of the legal framework within which the Dihlabeng Local Municipality Environmental Management Framework (EMF) would operate.

3.1 Introduction

The DLM is a Category "B" municipality in terms of South African municipal legislation[1].Section 1 of the Local Government: Municipal Structures Act, 1998 (Act 117 of 1998), as amended, defines "local municipality" as follows:

"Local municipality" means a municipality that shares municipal executive and legislative authority in its area with a district municipality within whose area it falls, and which is described in section 155(1) of the Constitution as a category B municipality;

The statutory and constitutional obligations[2] of the Dihlabeng Local Municipality require that it integrates social, economic and environmental factors into the planning, implementation and evaluation of its decisions. This should direct the municipality's development activities so that the needs of the present generation will be served without compromising the ability of future generations to meet their own needs.

3.2 Legislative and policy context for the management of natural resources at Local municipal level

3.2.1 Legislation for local government

The policy and legislative framework for local government in South Africa is illustrated in Figure 3.1. Legislation of relevance for an EMF in the context of local government includes the following:

- The Constitution of the Republic of South Africa Act, 1996 (Act 108 of 1996);
- Organised Local Government Act, 1997 (Act 52 of 1997);
- Intergovernmental Relations Framework Act, 2005 (Act 13 of 2005);
- Local Government: Cross-Boundary Municipalities Act (Act 29 of 2000);
- Development Facilitation Act, 1995 (Act 67 of 1995).

[1] Sections 3, 6, 10, 83-89 of the Municipal Structures Act, 1998.

[2] See Sections 24, 155, 156 and 229 of the Constitution of the Republic of South Africa, 1996 (Act 108 of 1996); Sections 83, sub-section (2) in particular, and 84 of the Local Government: Municipal Structures Act, 1998 (Act 117 of 1998), (as amended); Local Government: Municipal Structures Amendment Act, 2000 (Act 33 of 2000).

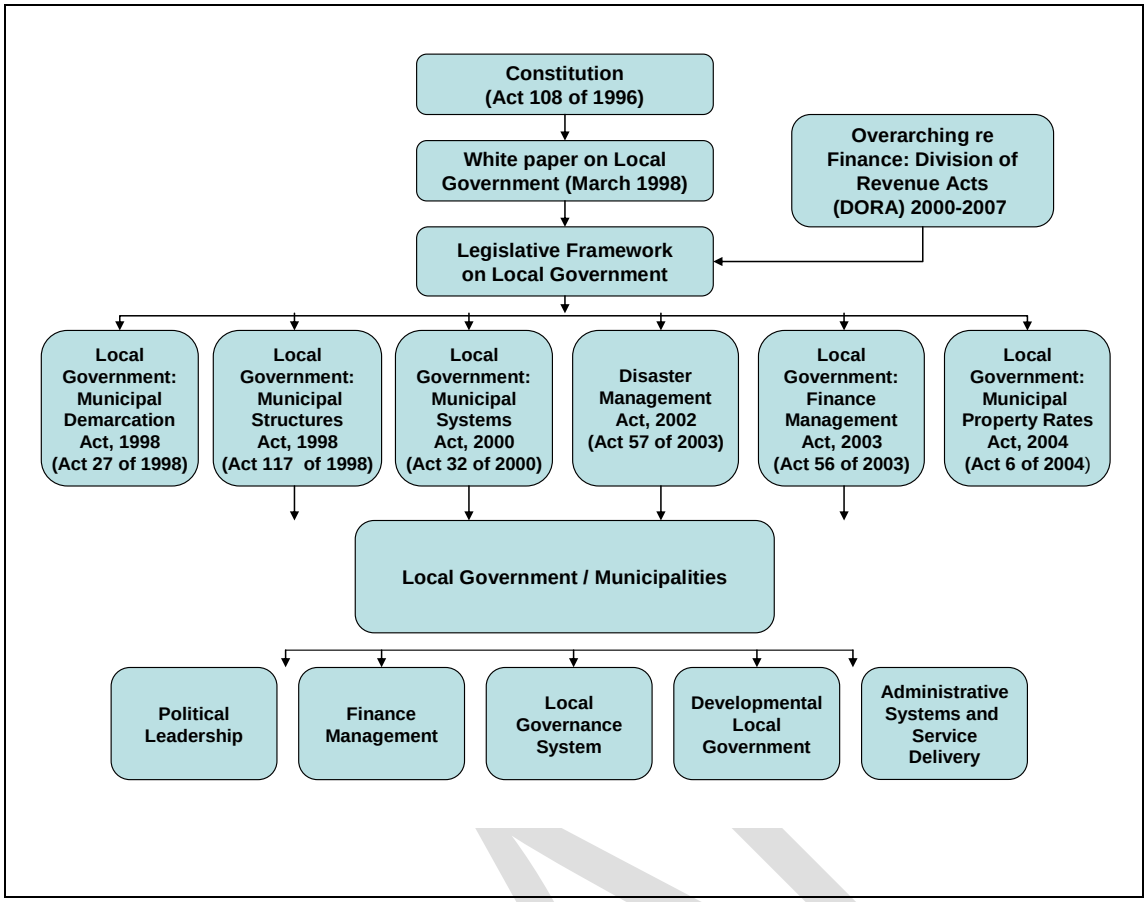

Figure 3.1: Policy and legislative framework for local government in South Africa

3.2.2 The constitution of South Africa, 1996 (Act No. 108 of 1996)

The constitution is the supreme law of South Africa and prescribes minimum standards which all laws must comply with. The constitution is binding to the legislature, the executive, the judiciary and all organs of the state. Basic human rights are enshrined in the constitution"s Bill of Rights. The following fundamental rights are relevant in the legal and environmental context in which the Dihlabeng Local Municipality EMF would operate. Section 24 states that:
„Everyone has the right to:

- An environment that is not harmful to their health or well-being;
- Have the environment protected, for the benefit of present and future generations through legislative and other measures that
- Prevent pollution and ecological degradation
- Promote conservation
- Secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development

Section 24 reconciles development and conservation and emphasizes the prevention of pollution and ecological degradation and places the obligation on government [Section 24(b)(iii)] to simultaneously promote justifiable economic and social development.

3.2.3 The Environment Conservation Act, 1989 (Act No. 73 of 1989)

In addition to the environmental rights enshrined in the constitution, an important strategy for ensuring a good foundation for development is contained in the environmental policy promulgated in terms of the Environment Conservation Act (ECA), 1989 (Act No. 73 of 1989).

Control of Environmental pollution and waste management requirements (Section 20)

Over and above measures targeted at prohibiting littering, the Act regulates waste management and waste disposal sites. A disposal site is a defined as „a site used for the accumulation of waste for the purpose disposing or treatment of such waste". The ECA requires every person who establishes, provides or operates any disposal site to obtain a permit from the Minister of Water Affairs. Waste is defined as „any matter (whether gaseous, liquid or solid or any combination thereof) which is an undesirable or superfluous by-product, emission, residue or remainder of any process which originates from any residential, commercial or industrial area and which is:

i. discarded by any person;
ii. accumulated and stored by any person with the purpose of eventually discarding it, with or without prior treatment connected with the discarding thereof; or
iii. stored by any person with the purpose of recycling, re-using or extracting a useable product from such matter"

Noise control

There are regulations under the ECA pertaining to the control of noise, vibration and shock. The regulations also apply to the protection of employees in factories. Additional regulatory measures aimed at noise control in the workplace are contained in the regulations to the Occupational Health and Safety Act, 1993 (Act no 85 of 1993). Section 28 of the Act refers to relevant SABS standards and limits certain kinds of development within a noise level corresponding to the 70dBA limit.

3.2.4 National Environmental Management Act, 1998 (Act No. 107 of 1998)

The National Environmental Management Act (NEMA), 1998 (Act No 107 of 1998) replaces some provisions of the Environmental Conservation Act, 1989 (Act No 73 of 1989) and regulates the National Environmental Policy. NEMA was promulgated to implement the constitutional right to a healthy and protected environment and supports the constitutional principle of sustainable development. The Act principally focuses on cooperative governance, with Chapter 1 setting out the principles to be adhered to by all spheres of government in managing the environment. Important principles relating to integrated environmental management are stated in Chapter 5. The key objective is to integrate principles of environmental management into the planning and development process and to identify, predict and evaluate the effects that policies, programmes and proposals or projects may have on the environment. The procedures for giving effect to international agreements are spelt out in Chapter 6 and Chapter 7 addresses issues of compliance and enforcement. NEMA also provides for the effective protection and controlled utilisation of the environment and contains important provisions that are key to the Dihlabeng EMF.

Control of activities which may have a detrimental effect on the environment (environmental impact regulations) Section 24.

Certain activities that may have a significant detrimental effect on the environment have been identified. No person is allowed to undertake an activity identified as such or cause such an activity to be undertaken except by virtue of a written authorisation issued by the Minister of Environmental Affairs and Tourism or by a competent authority. The authorisation may only be issued after consideration of reports concerning the impact of the proposed activity and of alternative proposed activities on the environment. The degree of detail required for these reports is determined by the relevant authority and may vary from a brief „scoping" report to a full environmental impact assessment.

3.2.5 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The act provides for the management and conservation of South Africa's biodiversity, through biodiversity planning and monitoring; the protection of threatened ecosystems and species; the control and management of alien and invasive species; the regulation of bio prospecting; fair and equitable benefit-sharing and the regulation of permits. Key sections in this Act include listing of threatened and protected ecosystems by the Minister or MEC. Once listed, these ecosystems will have to be taken into account in IDPs, and will be considered special areas in terms of NEMA. The act addresses invasive alien species control stating that "all organs of state in all spheres of government must prepare an invasive species monitoring, control and eradication plan for land under their control, as part of their environmental plans in accordance with section 11 of the National Environmental Management Act" and that "invasive species monitoring, control and eradication plans of municipalities must be part of their integrated development plans".

The status of ecosystems, and those highlighted as threatened (Critically Endangered, Endangered, Vulnerable) in terms of Section 52(2) of the Biodiversity Act, in particular, should inform future actions and decisions taken by local authorities. At provincial level, Brownlie (2005) highlights some key considerations:

- Provincial and local planning must be aligned to South Africa's National Biodiversity Strategy and Action Plan (NBSAP) and with the National Spatial Biodiversity Assessment (NSBA);
- Ecological corridors through the landscape identified by SDFs must be used to inform land-use decision-making at the local authority level;
- Municipal IDPs and SDFs supersede all other plans that guide local development, and provide the opportunity to "mainstream" biodiversity priorities in the municipal planning system.

The Free State Provincial Spatial Development Framework (FSPSDF) and municipal spatial development frameworks in terms of the Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000) have a direct impact on the management and conservation of biodiversity at local authority level.

The National Department of Environmental Affairs and Tourism (DEAT), now known as the Department of Environmental Affairs, is responsible for biodiversity conservation in South Africa, through the South African National Biodiversity Institute. Local government does not have a constitutional responsibility for environmental management or biodiversity conservation, these are functions of provincial and national government, as described in Schedule 4 of the Constitution of the Republic of South Africa Act, 1996 (Act 108 of 1996). This Schedule sets aside the following functional areas that are relevant for management of biophysical resources as exclusive to local legislative competence:

- Air pollution;
- Fire fighting services;
- Storm water management systems in built-up areas;
- Water and sanitation services limited to potable water supply systems and domestic waste-water and sewage disposal.

At national level the following legislation is relevant for the conservation and management of biodiversity:

- Constitution of the Republic of South Africa Act, 1996 (Act No 108 of 1996)
- National Environmental Management Act (NEMA), 1998 (Act No 107 of 1998)
- National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)
- National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)
- EIA Regulations in terms of NEMA (July 2006, GN385,386,387 published in Government Gazette on 21 April 2006)

- Development Facilitation Act, 1995 (Act No. 67 of 1995)
- Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970)
- National Heritage Resources Act, 1999 (Act No. 25 of 1999), and provincial regulations
- National Water Act, 1998 (Act No. 36 of 1998)
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
- Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
- National Forests Act, 1998 (Act No. 84 of 1998)
- National Veld and Forest Fire, 1998 (Act No. 101 of 1998)

3.2.6 National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)

The National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) provides for the protection and conservation of ecologically viable areas representative of the biodiversity and natural landscapes and seascapes of South Africa. The Act also provides for the establishment of a national register of all national, provincial and local protected areas, for the management of those areas in accordance with national norms and standards, and for intergovernmental cooperation and public consultation on matters pertaining to protected areas.

3.2.7 National Water Act, 1998 (Act No. 36 of 1998)

The National water Act, 1998 (Act No 36 of 1998) regulates the protection, use, development conservation and control of South Africa"s water resources. The definition of water use applied in the act makes the act applicable to most industrial water demands and practices.

Use of water

Water use (including both ground and surface water), includes the act of taking water from a water resource, storing water, impeding or diverting the water , flow of water and the water course, engaging in stream flow reduction activities, discharging waste or water containing waste into a water resource,, disposing in any manner, water which contains waste from or which has been heated in an industrial power generation process, altering the bed, banks, course or characteristic of a water course, and removing, discharging disposing of water found underground if it is necessary for the continuation of an activity for the safety of people. Chapter 4 of the Act sets out general principles for regulating water use, through general authorisations and licences. This includes the Minister limiting the amount of water which a responsible authority may allocate. Land-based activities which reduce stream flow may be declared to be stream flow reduction activities, and activities that have a detrimental impact on water resources may be declared controlled activities.

Prevention of pollution

In addition to placing a general obligation on specified people not to pollute water, the act provides specific measures to be legislated in the form of regulations. The provisions of the Act that aim to remedy the effects of pollution apply in retrospect and impose a duty on a land owner, a person in control of land or a person who occupies or uses land on which any activity or process is or was performed or undertaken, which causes, has caused or is likely to cause pollution of a water resource to take all reasonable measures to prevent any such pollution from occurring, recurring and to clean up the effects of pollution.

3.2.8 National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)

The Act provides for national norms and standards controlling air quality monitoring, management, and control by all spheres of government. Chapter 2 of the Act provides for the establishment of a national framework for achieving the objects of the Act, and for the setting of national, provincial and local ambient air quality and emission standards.

Chapter 4 allows for the declaration and management of priority areas, for the listing of activities that result in atmospheric emissions, the declaration and control of controlled emitters and fuels, and other measures such as pollution prevention plans, atmospheric impact reports, and programmes for the public recognition of significant achievements in the area of pollution prevention.

Of relevance for local government is Section 11 that allows a municipality to promulgate by-laws to identify substances or mixtures of substances in ambient air, and establish standards for emissions from point, non-point or mobile sources in the municipality. Section 14 provides for each municipality to designate an air quality officer from its administration to be responsible for co-ordinating matters pertaining to air quality management in the municipality. In terms of Section 15(2), each municipality must include in its integrated development plan an air quality management plan. Section 36 charges Metropolitan and district municipalities with implementing the atmospheric emission licensing system, and must for this purpose perform the functions of licensing authority.

3.2.9 Conservation of Agricultural Resources Act (CARA), 1983. (Act No 43 of 1983)

The Act provides for the conservation of natural agricultural resources by maintaining the production potential of land, combating and preventing erosion and weakening or destruction of water resources, protecting vegetation and combating weeds and invader plant species.

In 1984, amendments were passed in terms of the Conservation of Agricultural Resources Act (CARA) declaring about 50 species “weeds” or “invader plants”. The amendment now has a comprehensive list of species that are declared weeds and invader plants and has also divided the species into three categories.

Category 1 species (e.g. Triffid Weed, Lantana). As declared weeds, they may not occur on any land or on any inland water surface throughout South Africa. No person may sell, advertise, exhibit, transmit, send, deliver for sale, exchange or dispose of any weed. It is also illegal to cause or permit the dispersal of any weed from one place to another.

Category 2 species (such as pine and gum) are also problematic but are more commonly grown for commercial purposes or any viable and beneficial function, such as woodlots, fire belts, building material, animal fodder and soil stabilization. The government is fully supportive of the commercial ventures based on these species, recognizing as it does the important contribution that they make to the South African economy and the welfare of its people.

These invader plants can only be grown in areas demarcated as sites where such plants may be established and retained. In terms of demarcation, any area where a water use license for stream flow reduction activities has been issued (in terms of section 36 of the National Water Act, 36 of 1998) is deemed to be demarcated in the terms of CARA. An example is a registered timber plantation.

No area can be demarcated for the growing of Category 2 plants unless the land user is able to establish that the invader plants shall be confined to the area, and that the cultivation of the invader plants shall be strictly controlled. (DOA, 1983)

3.2.10 National Heritage Resources Act, 1999 (Act No 25 of 1999)

The aim of the National Heritage Resources Act is to introduce an integrated and interactive system for the management of the national heritage resources, to promote good government at all levels and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations. The Act also lays down general principles for governing heritage resources management throughout South Africa. Section 8 of this Act

provides a three-tier system for heritage resources management, in which national level functions are the responsibility of the South Africa Heritage Resource Agency (SAHRA), provincial level functions are the responsibility of provincial heritage resources authorities and local level functions are the responsibility of local authorities.

Of particular relevance to an EMF is the fact that Section 31 of the Act allows a local authority, after proper consultation to designate any area or land to be a heritage area, by notice in the *Provincial Gazette,* on the grounds of its environmental or cultural interest or the presence of heritage resources. Such a heritage area must be protected through the provisions of its planning scheme or by-laws under this Act, provided that any such protective provisions shall be jointly approved by the provincial heritage resources authority, the provincial planning authority and the local authority and subject to further provisions of the Act.

3.2.11 Land Use Management Principles

The White Paper on Spatial Planning and Land-use Management of 20 July 2001 defines the principle of sustainability as the sustainable management and use of the resources making up the natural and built environment. It includes the following norms:

- Land may be used or developed only in accordance with the law;
- The general interest as reflected in national, provincial and local policies should enjoy preference over private interests in spatial planning, land-use management and land development processes and decisions;
- Disaster management, including prevention and mitigation, should be an integral part of all spatial planning, land-use management and land development and a primary concern in all land-use management decisions;
- The protection of natural, environmental and cultural resources should be a primary aim in all spatial planning, land-use management and land development processes and decisions;
- Land used for agricultural purposes may only be reallocated to another use where real need exists, and prime agricultural land should as far as possible remain available for production.

The Land Use Management Bill, 23 June 2003 sets out basic principles to guide spatial planning, land use management and land development at national, regional, provincial and municipal level. In terms of Section 17(1) of the Bill, an SDF must:

- Give effect to directive principles;
- Be consistent with the national spatial development framework;
- Be consistent with the provincial spatial development framework of the province within which the municipality is located;
- Be consistent with any applicable national or provincial legislation on environmental management; and
- Give effect to any national and provincial plans and planning legislation.

A municipal SDF must at least reflect:

- The current state of affairs report on land use in the municipality, including any spatial dysfunctionality that exists;
- A conceptual framework of the desired spatial growth patterns in the municipality;

3.3 Local level instruments

3.3.1 Free State Provincial Growth and Development Strategy (FSPGDS 2007)

The Free State Provincial Growth and Development Strategy (FSPG, 2005-2014) is the fundamental policy framework for the Free State Provincial Government The FSPGDS

addresses the key and most fundamental issues of development, covering the social, economic and political environment.
Four priority areas of intervention have been identified by the province, namely:

- Economic development and employment creation;
- Social and human development;
- Justice and crime prevention;
- Efficient administration and good governance.

The FSPGDS recommends the following for Dihlabeng district:

- Develop Clarens but include surrounding towns for the weekend and short-break market;
- Careful development of nature-based activities
- Integrate the Lesotho Highlands with tourism in the area.
- Broaden the extent to which Lesotho is a day-trip destination for visitors – presently this is focused on Clarens.

3.3.2 Free State Development Plan (FSDP)

The FSDP (FSPG, 2001) was commissioned to address economic and socio-economic concerns in the province. The Plan has five key priority areas, namely:

- Enhancing economic development and job creation.
- Providing and facilitating the sustainable development of infrastructure.
- Investing in the development of the people of the province.
- Ensuring a safe and secure environment.
- Good co-operative governance with the sustainable use of resources and the environment.

In its IDP for 2007/8 (Dihlabeng, 2006b), the DLM has aligned its environmental priorities with the FSDP as follows:

- Tourism growth, land reform - enhancing economic development and job creation.
- Disaster management - ensuring a safe and secure environment.
- Environmental care and urban greening - Good co-operative governance with the sustainable use of resources and the environment.

3.3.3 Provincial Environmental Implementation Plan (PEIP)

Section 12 of the National Environmental Management Act, 1998 (Act 107 of 1998) requires provinces to prepare Environmental Implementation Plans, to give effect to the principle of co-operative government as spelt in Chapter 3 of the Constitution and to secure the protection of the environment across the country as a whole. In terms of Section 16(4), each provincial government must ensure that municipalities comply with the Provincial Environmental Implementation Plan (PEIP) and the principles contained in Section 2 of the Act, in the preparation of their IDPs. Implementation of the PEIP should result in the alignment of policy, legislation, plans, programmes and decision-making and thus, more effective and integrated co-operative governance of environmental management functions.

Key environmental issues identified in the Free State Environmental Implementation Plan (PEIP) (Dihlabeng, 2006a) were:

- Increase in levels and concentration of pollution and waste caused by household fires,
- Dust pollution in relation to mining and marginal agricultural practises,
- Mining and industrial discharges,
- Transport activities,
- Erection of masts and signage,
- Agricultural production and food processing as well as insufficient treatment and disposal facilities for sewage,
- Hazardous and domestic waste.

A strategic guideline for the Dihlabeng IDP is that these key issues should be the focus for improved co-operative governance to ensure long-term sustainability in the province and municipality.

3.3.4 Integrated Development Plan (IDP)

The National Environmental Management Act (NEMA), 1998 (Act No 107 of 1998) provides for co-operative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of state. It is a requirement that the following principles in Section 2 of NEMA be incorporated into decision making by organs of state:

- Development must be socially, environmentally and economically sustainable.
- Environmental management must put people at the forefront of its concern and serve all their interests equitably, and integrate social, environmental and economic dimensions.
- Equitable access to environmental resources.
- Health and safety consequences must be considered.
- Participation of all interested and affected parties in environmental governance.
- Community empowerment must be promoted through environmental education.

The following DLM priorities as stated in the municipality"s IDP (Dihlabeng Integrated Development Plan, 2009/2010) are of relevance to an EMF:

- Priority 2, Objective 3: Improve manufacturing sector by encouraging environmentally-friendly industries that will utilise natural resources;
- Priority 4, Objective 1: Protection of the existing natural environment. Most economic activities in the municipality are in the agricultural sector; subdivisions of land for tourism and recreation purposes have been restricted. The most serious threats to soil resources of agricultural significance are erosion, compaction, acidification, salination and infestation by weeds and pathogens. Mining activities are sand and silt winning, sandstone cutting and gravel exploitation;
- Priority 4, Objective 2: Identify and develop new environmental areas and reserves. Environmentally sensitive areas are mostly riparian, where there is a unique indigenous plant community on river banks;
- Priority 6, Objective 1: To promote and enhance tourism opportunities in order to become a popular tourist destination;
- Priority 12, Objective 1: Facilitate provision of adequate affordable housing and serviced stands for residents;
- Priority 14, Objective 2: Provide comprehensive environmental health services to the people of Dihlabeng;
- Priority 16, Objective 2: Support the land re-distribution process of the Department of Land Affairs;
- Priority 19, Objective 2: To improve our capacity to handle all natural and human disasters.

3.3.5 Dihlabeng Spatial Development Framework

The formulation of a Spatial Development Framework is a legal requirement in terms of Section 26(e) of Chapter 5 of the Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000), and is an integral part of the IDP for the DLM. It operates as an indicative plan, with a forward planning focus.

Section 35(2) of the Act states that it prevails over plans defined by Section 1 of the Physical Planning Act, 1991 (Act No.125 of 1991). It needs to be quite specific and precise in cases where there is need to enforce or prevent certain types of land use, but does not have to be prescriptive with regard to the way each and every piece of land shall be used.

The DLM IDP"s spatial objectives are:

- Promotion of integration of all communities
- Facilitation of local economic growth which is compatible with the needs of small, micro and medium enterprises;
- Stimulation of agricultural development;
- Optimal utilisation of existing infrastructure, services and land;
- Accommodation of the diverse socio-economic needs of the local community and potential investors.

The EMF will contribute to meeting the spatial objectives and will particularly address itself to specific issues noted in the Dihlabeng SDF (2007/2008), among them:

- Synchronisation of tourism development with environmental conservation especially in the context of developments adjacent to dams and rivers;
- Using existing infrastructure and land more optimally;
- Promotion of agricultural development while managing threats to natural resources;
- Managing interactions between the natural, social and economic environments;
- Integration of communities to achieve an optimal mix of land uses.

International agreements

South Africa has international obligations in terms of international environmental agreements to which the country is a signatory. Some of the agreements which would be of relevance to an EMF are:

- Convention on Biological Diversity (1992);
- The Ramsar Convention (on wetlands of international importance especially as waterfowl habitat) (1971);
- The Bonn Convention (on conservation of migratory species of wild animals) (1991)
- The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (1973);
- United Nations Convention to Combat Desertification (UNCCD) (1994);
- Montreal Protocol on the Protection of the Ozone layer (1990);
- Basel Convention on the control of trans-boundary movements of hazardous wastes and their disposal (1994).
- Convention concerning the protection of the world cultural and natural heritage (World Heritage Convention) (1997).

4. ENVIRONMENTAL CONSTRAINTS AND OPPORTUNITIES IN DIHLABENG LOCAL MUNICIPALITY

4.1 General opportunities and constraints

The state of environment places constraints on development and also presents opportunities for development. In addition to constraints and opportunities resulting from biophysical environmental conditions, in a municipality, social and economic factors also influence development choices. This section highlights the key environmental issues and their implications for development in DLM. These constraints and opportunities have to be understood and considered in the context of social and economic development pressures. In DLM pressures on the environment include:

- Demand for land in sensitive areas for tourism development;
- Urban sprawl, particularly in Bethlehem;
- Demand for land in both highly sensitive and less sensitive areas for housing in all the towns;
- Need to create employment opportunities;
- Need to provide services such as water, sanitation and electricity;
- Silting up of dams;
- Smoke pollution – mainly from fires for cooking purposes and veld fires;
- Lack of proper sanitation – this poses a serious threat of pollution of ground water;
- Littering;
- High livestock numbers per unit of land in the small scale agriculture sector; resulting in overgrazing and erosion;
- Demand for woody vegetation for use as firewood.

Ecological constraints

Most of the land in DLM is covered by grassland and this is mostly comprised of endangered vegetation. Red Data listed species of flora and fauna also occur in the grasslands of DLM. In addition to vegetation, sensitive areas in DLM also include riparian areas, dams, ridges and wetlands. These ecological conditions place constraints on development as development is excluded or can only take place under special conditions in these areas. However, transformation has occurred in some of the ecologically sensitive areas of DLM due to developments such as urban settlements, mining, agriculture and industry.

Ecological opportunities

The ecological conditions in DLM present development opportunities linked to tourism. The natural environment in DLM attracts tourists to the area due to the scenery. Tourism underpinned by the natural environment is growing and is projected to grow in the future. Tourism development supports economic and social development through local economic development and employment creation.

Agricultural constraints

One of the constraints to development in DLM is the extensive occurrence of land that is under agricultural production. Agriculture is a key economic sector in the area and the stimulation and optimization of agricultural production is one of the DLM priorities articulated in the IDP (2009/2010). The development objectives in agricultural areas are focussed on maintaining agricultural production and protection of the agricultural resource base. Threats to the agricultural resource base include risks to soil resources, among them erosion, compaction, acidification and infestation by pathogens and weeds, and these risks endanger agricultural production (Dihlabeng SDF, 2008/2009). Due to the need to safeguard and maintain agricultural

production, development, except for specified activities linked to agriculture and tourism is severely restricted in areas under productive agriculture.

Agricultural opportunities.

Although general development is excluded from agricultural areas, areas under agriculture present opportunities for development linked to agricultural packaging, processing and general value addition to agricultural produce. These opportunities are linked to increased economic activity and employment prospects.

Constraints in urban areas

In urban areas, the open space system, focussed on the protection and conservation of ecologically sensitive areas including all land adjacent to rivers, wetlands, certain ridges and koppies and dams is one of the constraints to development. The ecologically sensitive areas are protected from development. The need to contain urban sprawl and promote integrated compact urban areas is another development constraint in the urban areas, particularly in Bethlehem. Developments cannot occur beyond the urban edge and have to take place in designated locations within the urban area.

Opportunities in urban areas

The ecologically sensitive areas around dams present opportunities for recreational and residential development and tourism development. DLM supports residential and recreational developments at the Loch Athlone and Saulspoort Dams subject to rigorous Environmental Impact Assessments and the fulfilment of other specified requirements. These areas attract tourists and provide economic opportunities for DLM.

4.2 Opportunities and constraints in DLM in the context of Development Planning

4.2.1 The Integrated Development Plan (IDP)

The Dihlabeng Local Municipality Integrated Development Plan (2009/2010) is a strategic planning instrument which guides and informs all planning, budgeting, management and decision making in the municipality. The EMF complements the IDP and will guide implementation of projects under the IDP. The EMF is crucial in this regard as by law the IDP process must ensure that all possible environment related activities as identified in the regulations and described in section 21(1) of the Environment Conservation Act (Act 73 of 1989) are identified in a timely manner. In addition, the IDP process has to adhere to principles of sustainable development, and advocate for development that is environmentally sensitive (Dihlabeng IDP, 2009/2010). Under the Dihlabeng IDP, all projects and „actions where an environmental impact is envisaged will be listed and registered with the Department of Environmental Affairs. Environmental Management in projects supported under the IDP projects should be aligned to local environmental management and environmental implementation plans. Although NEMA requires that an Environmental Management Plan and an Environmental Implementation Plan should be prepared for the Free State Province, these plans are not yet available.

Some development initiatives in DLM as listed in the Dihlabeng IDP (2009/2010) adequately utilise the environmental opportunities in DLM while others could be in conflict with the environment. The EMF, used in conjunction with the IDP will guide the implementation of projects to minimize conflict between development and the environment. Development initiatives listed in the Dihlabeng IDP (2009/2010) to which the EMF will be directly applicable include:

- Acquisition of farms in the vicinity of Bethlehem, Clarens and Rosendal to provide land for small scale agricultural activities (grazing and crop cultivation) for residents in some areas. This initiative presents opportunities for broadening the economic base of the

area as listed in Priority 2, objective 1 of the IDP and does not threaten the maintenance of agricultural activity in DLM.

- Development of facilities to support tourism such as a casino in the Loch Athlone resort, a golf estate and gallery in Clarens in accordance with Priority 6 of the IDP. These developments although economically desirable could be in conflict with the ecology of the DLM. The EMF addresses this potential conflict by providing guidelines for how development should proceed in these areas.

- Subdivision and development of several farms in the vicinity of Clarens for holiday, tourism and permanent residential purposes. This development initiative is in conflict with the ecological conditions in the area and the need to maintain agricultural use of land. The EMF indicates the activities which should and should not take place in identified areas and lays guidelines for what should be done for development to proceed and for maintaining agricultural use of the land.

- Identification of land for future extension of the high density residential area of Bohlokong in Bethlehem. This development initiative although potentially in conflict with the desired maintenance of agricultural and ecological conditions in DLM, has to take place since urban growth is a reality. The EMF provides guidelines for balancing urban developments with the maintenance of ecological conditions.

- Confining development of Bethlehem to the west of the town in order to avoid pressure on the Saulspoort Dam and the Loch Athlone natural environment. This development initiative aims to minimize conflict with the environment. The EMF provides guidance for the expansion of the urban areas and identifies an expansion zone where conflict with the environment would be minimal.

4.2.2 Dihlabeng IDP objectives and strategies in relation to utilization of environmental opportunities and potential conflicts with the environment

The DLM priorities, objectives and strategies (Dihlabeng IDP Strategic Planning, 2009/2010 IDP Review Cycle) which are in linked to the environment in some way and their environmental implications including the role of the EMF are:

Priority 1: Providing and facilitating sustainable infrastructure relating to sanitation, bulk and internal water supply, roads and storm water systems. Objectives under this priority include improving services such as water and sanitation, maintenance and upgrading of water, road and sanitation infrastructure including provision of new infrastructure. The provision of infrastructure if done within the urban development provisions as specified in the EMF would not be in conflict with the environment.

Priority 2: Local Economic Development. Objective 2 of this priority aims to create employment by promoting viable economic opportunities while objective 3 aims to improve the manufacturing sector by encouraging environmentally friendly industries that will utilize local natural resources. Objective 2, depending on how it is implemented could be in conflict with or enhance the environment of DLM. The EMF supports this priority by providing information on where to locate different economic activities in the DLM and the requirements for these activities.

Priority 4: Environmental care and urban greening. The objectives under this priority include „protection of the existing natural environment", „identifying and developing new environmental areas or reserves" and „urban greening of parks and sidewalks". This priority is based on utilising the opportunities presented by the natural environment of DLM. The EMF enhances this priority by providing guidelines for the management of areas where the maintenance of ecological conditions and/or conservation are desired.

Priority 6: Tourism growth. One of the objectives under this priority is „the promotion and enhancement of tourism opportunities and includes strategies such as the establishment of tourist facilities in townships. This priority takes advantage of the opportunities for tourism presented by the natural environment in DLM but could be in conflict with the environment if it does not maintain the ecological and conservation status of the area. The EMF addresses the potential conflict by giving guidelines for tourism development to maintain ecological and conservation functions of the DLM environment.

Priority 12: Housing. The objective under this priority is to facilitate the provision of adequate affordable housing and serviced stands for residents. Housing developments entail the utilization of land which could potentially be serving an ecological function. The EMF recognises the need for urban use of land for residential and other uses and provides guidelines for this land use.

Priority 14: Health and social welfare. Objective 2 under this priority aims to „provide comprehensive environmental health services to the community of Dihlabeng" and includes strategies such as minimizing exposure of residents of DLM to harmful radiation, air and noise pollution and access to safe water. The EMF supports this priority by providing guidelines for development to ensure maintenance of a safe and healthy environment.

Priority 16: Land reform. Objective 2 under this priority is „to support the land redistribution process of the Department of Land Affairs" and includes strategies such as "obtaining adequate commonage land according to the needs of respective urban areas" . This priority utilizes the agricultural opportunities in DLM to increase economic opportunities for residents and would not be in conflict within the environment if the land is utilized as intended. The EMF highlights small scale agricultural activities as part of agricultural land use and provides guidelines for maintaining agricultural production.

4.2.3 The Dihlabeng Local Municipality Spatial Development Framework (SDF): utilization of environmental opportunities and potential conflicts with the environment

There is minimal conflict between planned land use and the environment in DLM as the Dihlabeng SDF (2008/2009) in designating areas for different uses i.e. for urban areas, conservation areas, cultivated land, tourism nodes and the transport corridor (N5 highway) takes cognisance of environmental sensitivity. The EMF is guided by the SDF and delineates environmental management zones in line with the SDF so as to harmonize environmental management with existing and planned land use.

Urban land use and urban expansion: The Dihlabeng SDF (2008/2009) points out that Bethlehem will remain the primary commercial economic hub of DLM with the other towns providing services at a local level. The SDF highlights the growth of Bethlehem, indicating the demand for housing and makes provision for urban expansion into agricultural land including the purchase of farms (e.g. Vogelfontein) for housing development. The SDF also emphasizes that there is increasing establishment of residential areas to the east of Bethlehem and the expansion of the Bethlehem CBD to the east including the extension of Bohlokong residential area and residential development east and west of Loch Athlone Dam. Future township development on the east of the city, west of Saulspoort Dam is also indicated. The expansion of Bethlehem is in conflict with the need to maintain agricultural and/or ecological use of land. To minimize conflict between urban expansion and land uses such as agriculture and conservation, the EMF, in addition to providing guidelines for maintaining production of land which is under agriculture, has identified an area of low agricultural activity and low conservation significance

with access routes where urban expansion can take place without conflicting with agricultural and conservation activities.

In Clarens, the SDF indicates that all undeveloped areas should form part of the open space system. This use of land would enhance the ecological and conservation opportunities of Clarens. Developments planned for Clarens in the SDF include a golf estate, a township and tourist facilities such as accommodation and restaurants. The golf estate and township would be located within the urban edge and would, therefore, not be in conflict with the environment if developments are carried out according to the various local and national provisions. The EMF provides guidelines for these developments. There is limited growth potential for the CBD in Paul Roux and the SDF does not give specific direction for development. The SDF, however, highlights the long term upgrading of the N5 highway. The EMF identifies the N5 highway as a development corridor and lists the activities that should and should not take place in the corridor including management guidelines. In the SDF, developments planned for Fouriesburg include upgrading of sports facilities, extension of the cemetery and extension of the township. Part of the township extension would lie outside the urban edge and would occupy agricultural land. This would be in conflict with the environment. The EMF highlights the importance of maintaining agricultural land but accepts the inevitability of urban growth and provides guidelines for developments that have to take place on agricultural land.

Tourism: The SDF highlights the fact that the economic growth potential of the smaller towns in DLM would be focused on tourism and the provision of services to the agricultural community. The SDF further emphasizes the tourism potential of DLM and the importance of the agricultural sector and indicates development corridors and tourism corridors in certain areas, for example along provincial roads. Tourism is an important economic activity in DLM as highlighted by both the SDF and the EMF. The importance of maintaining the ecological integrity of areas under tourism is also emphasized as the SDF highlights that any developments along the riparian and ecologically sensitive area for recreation and tourism purposes should be monitored and preceded by a permit application in terms of the Physical Planning Act (Act No. 88 of 1967). In line with the SDF, the EMF indicates the specific areas where tourism should be the focus and provides guidelines for tourism oriented developments.

Change in land use from agriculture to conservancies and tourism oriented use: The SDF points out that change of farms into areas of conservancies should be supported. While not contradicting the SDF position, the EMF highlights the growing trend of converting agricultural land to tourism and the potential food security implications of the trend. The EMF indicates the importance of maintaining land under agricultural use and provides guidelines for conversion of land from agricultural use to tourism and/or conservation use.

Mining: The Dihlabeng SDF indicates that mining activities such as gravel extraction and sandstone mining should not be allowed in areas specified in terms of sections 21, 22 and 26 of the Environmental Conservation Act. The EMF reinforces this position and delineates mining areas to facilitate the containment of the environmental impacts of the activity. Exploitation of gravel in Wolhuterskop Nature Reserve without a proper rehabilitation programme is one of the concerns of the SDF. The EMF emphasizes that all mining activities have to comply with both national and local legislation and policies and highlights the legislation and policies to be complied with.

Developments in sensitive areas.
The SDF indicates that developments for residential and recreational purposes in the vicinity of Loch Athlone and Saulspoort Dams are supported by DLM, subject to thorough EIA. Despite the indication for EIA, residential developments in these areas would be in conflict with the environment as these are riparian areas where ecosystem function and services need to be maintained. The EMF addresses this potential conflict by indicating the land uses that should

not be permitted in this area and the conditions that have to be adhered to for developments to be permissible.

5. PUBLIC PARTICIPATION

A public participation process was undertaken to engage with interested and affected parties in the DLM in order to inform them about the EMF development process and to get information on environmental issues in DLM. The public participation process had two components: engaging and consulting with regulatory authorities in the area, i.e. officials of the DLM and the Free State provincial government and engaging with residents of DLM. Meetings with municipal and Free State government officials were held on 5 December 2007, 26 August 2008, 23 October 2008, 10 March 2009 and 9 December 2009. The meetings focussed on identification of interested and affected parties, environmental and developmental issues in the municipality, identification of sources of information and logistical issues. Meetings were held with the residents of the five towns in DLM from 9 to 13 March 2009 and from 7 to 11 December 2009.

5.1 Awareness of the EMF and environmental issues in Dihlabeng Local municipality

The first phase of meetings with residents of DLM was held from 9 to 13 March 2009**.** The objective of the meetings was to inform residents of the EMF development process and to solicit inputs on environmental issues in Dihlabeng. The meetings were advertised (venue, date, time and agenda) in three local newspapers (Maluti, Vrystaat and the Free State Business Bulletin) two weeks prior to the dates of the meetings. The advertisements for the meetings and minutes of the meetings are in Appendix 3. The environmental issues which were raised by residents of DLM are highlighted below:

Environmental issues in Bethlehem

1. State of dumping sites – rubbish not dumped properly, but strewn around.
2. There is water pollution in Ward 7 – the dumping site is close to source of water for domestic use
3. Soil erosion caused by waste laundry water thrown on the ground, taps and broken pipes is a problem in ward 7
4. Grass is not cut in residential areas
5. Litter is a major problem in residential areas
6. Open spaces in the townships are bushy and unkempt and are a security risk for residents as criminals hide in these areas

Environmental Issues in Clarens

- Poaching of indigenous flora for medicinal uses
- Poaching of animals
- Land degradation due to overgrazing – too many cattle on community land and these cattle are sometimes grazed in the conservancy during periods when grazing is insufficient – as a consequence, soil erosion is a problem and is visible both on the community land and in the conservancy.
- Water pollution due to illegal dumping and problems with municipal sewage treatment
- Although Clarens is not an agricultural area, there is a community agricultural project under the municipality which might be impacting on the environment
- Illegal dumping, especially of building rubble is common
- Air pollution due to veld fires and household fires
- Lack of resources to maintain hiking trails in conservancies
- Invasive alien species are a problem – Department of Water Affairs and Forestry contracted people to remove the invasive plants, - programme not entirely successful –

led to environmental problems such as collapse of river banks when the plants were removed. An additional problem with the programme is the lack of follow up removal of coppice growth – the invasive plants were only cut once and the herbicide treatment done was ineffective. A better solution to the invasive alien species problem is needed

- Shortage of firewood in the long term – currently the species removed for firewood are invasive aliens, however, removal of these species encourages their increase through coppicing. With increased demand for firewood as the population increases, the invasive plants are likely to be exhausted and indigenous species will be under pressure
- Lesotho Highlands Water Project- currently this has no environmental impact but there were impacts during tunnel construction –further information can be obtained from the company which constructed the tunnel – TCTA.
- Discharge of water from tunnel into Ash river has increased flow of water in the river – this has resulted in increased erosion and there are signs of silting of Sol Plaatje Dam.

Environmental Issues in Fouriesburg

1. Deforestation- trees are being cut for firewood as people cannot afford other fuels.
2. Soil erosion – Fouriesburg is hilly with steep slopes, therefore soil erosion is a problem. The problem is exacerbated by lack of storm water drainage systems – roads are washed away
3. Waste disposal and dumping sites:
    - Not enough rubbish containers are provided in the open spaces for waste disposal in the township;
    - There are several illegal waste dumping sites in the township – the sites are not secured and are accessed by children and this poses a health hazard and sites are a source of bad smells.
4. Open holes in areas around the township - traditional healers dig up medicinal plants but do not cover up the holes they create – the holes are a danger to people and livestock
5. Damage to water pipes – water pipes in the township are very shallow and get damaged during road maintenance operations – water is lost and the water also causes soil erosion.
6. Water shortages – the township experiences water shortages periodically, - water is especially a problem when the Caledon River dries up- this exposes residents to disease risks. It was noted that there is a reserve dam to supply Fouriesburg when water is not available from the Caledon River
7. Dirty water – the water supply to the township is sometimes dirty – the water pipeline to the township is being upgraded and this could be the cause of the dirty water.
8. Cattle kraals in the residential area – some township residents keep cattle and have built kraals in the residential area. Odours from the dung make the environment unpleasant. During the rainy season mosquitoes breed in the cattle kraals.
9. Litter – littering is a problem in the townships
10. There is a big hole from past quarrying activities is in the township and this poses a danger to residents and is a nuisance due to bad smells
11. Illegal sand mining is causing environmental degradation

5.2 The desired state of environment in Dihlabeng Local Municipality

The second phase of public participation meetings was held in Dihlabeng Local Municipality during the period 7 to 11 December 2009. The main purpose of the meetings was to present and discuss the environmental status quo report and to determine the desired state of environment for the area as well as opportunities and constraints**.**

5.3 The process

5.3.1 Distribution of the status quo report

Following compilation of the report on the environmental status quo of the DLM, hard copies and CD copies of the report were sent to the DLM and the Free State Department of Economic Development, Tourism and Environmental Affairs. The copies of the report were to be distributed to stakeholders within these institutions. Hard copies of the report sent to Dihlabeng municipality were deposited in the Bethlehem library and in the municipal offices in Bethlehem, Clarens, Fouriesburg, Paul Roux and Rosendal. The hard copies of the report were to be accessed by the public as required. The CD copies were distributed among officials within the municipality and the Free State Provincial Government.

5.3.2 Publicising the meetings

Newspaper advertisements.
The public participation was publicized through advertisements placed in three local newspapers: the Maluti, (25 November 2009), the Vrystaat (26 November 2009) and the Free State Business Bulletin (1 December 2009). The advertisements were approved by Dihlabeng Local Municipality before publication. The advertisements indicated where the hard copies of the status quo report could be accessed for review and provided a web link for accessing the report electronically. The duration of the comment period and how to submit comments on the report was also indicated. The advertisements also invited members of the public to meetings to discuss the status quo report and the desired state of environment. The dates, venues and times of the meetings were indicated in the advertisements. A copy of the advertisement sent to the newspapers and copies of advertisements as published in the three newspapers are shown in Appendix 4.

Announcements of meetings
In addition to the advertisements, the public was informed of the meetings through announcements made using loud hailers in the residential areas. The Dihlabeng Municipality was responsible for making these announcements.

5.3.3 Schedule of meetings

The public participation meetings were scheduled as follows:

Date	**Venue**	**Time**
7 December 2009	Bethlehem Town Hall	15:00-17:00
8 December 2009	Mashaeng Hall (Fouriesburg)	10:00-12:00
9 December 2009	Kgubetswane Hall (Clarens)	14:00-16:00
10 December 2009	Mautse Town Hall (Rosendal)	10:00-12:00
11 December 2009	Fateng Hall (Paul Roux)	10:00-12:00

The programme for each meeting was as follows:

a) Welcome
b) Presentation of the status quo report (done by CSIR in the local Sesotho language). The presentation also highlighted how the public could access the report, how the comment process would work and the deadlines.
c) Discussion of the status quo report – covering clarification of issues, inaccuracies, issues which the report had left out but which should be included in the report.

d) Presentation highlighting the development considerations which would influence the desired state of environment.
e) Discussion of the desired state of environment:
    a) consultation on the broad vision for further development in the municipality;
    b) targets for conservation of natural open space in the municipality;
    c) targets for conservation of ridges;
    d) targets for conservation of rare and endangered species;
    e) targets for water management;
    f) targets for ambient air quality;
    g) energy use;
    h) river health;
    i) groundwater use and quality;
    j) access to the open space system;
    k) conservation of cultural and historical elements;
    l) rehabilitation of derelict land;
    m) other issues.
f) Closure

The full minutes of the second phase of public participation meetings are in Appendix 3.

5.4 Outputs of the meetings

The status quo report
Residents of DLM who attended the public participation meetings did not have up front comments on the status quo report. Some promised to submit written comments.

The desired state of environment in DLM
Comments were made on the desired state of environment.

Fouriesberg
In the discussion leading to the broad vision for the further development of the municipality, it emerged that most of the people in Fouriesburg are employed on a seasonal basis at nearby farms. The main problem in the Fouriesburg community is unemployment.

- Broad vision for development of the municipality: The municipality should develop in a way that creates employment opportunities for residents;
- Basic infrastructure and services – development of the municipality has to cater for provision of infrastructure and services – services in the area are inadequate, for example people have to travel to Bethlehem to access basic groceries;
- Conservation of natural open space: open spaces in the town, and the township in particular should be conserved. The community does not have a park and would want some of the open space to be conserved through the creation of a park and its related infrastructure;
- Conservation of natural open space: open spaces not converted to parks should be conserved through maintenance of the natural grassland. Some of the open space could be utilised for growing medicinal plants;
- Agricultural zone: this zone should be demarcated to include areas designated for small scale farming. The people of Fouriesburg want to engage in crop cultivation and would want some of the surrounding farm land to be delineated for small scale agriculture and to be made available to them. The availability of land for small scale farming should be accompanied by proper support to ensure that production is maintained and environmental degradation minimised;
- Agricultural zone: the agricultural zone should be demarcated to include areas which can be used for communal livestock grazing. This would address the problem of people keeping cattle in the township;
- Targets to water management: consistent supplies of high quality water should be provided to residents.

Clarens

- Broad vision for development of the municipality: Opportunities presented by tourism in the area should be made accessible to all people in the town including those in the township. This includes the need for residents of Kgubetswane to access land in order to build tourist facilities to provide services such as accommodation and restaurants;
- Basic infrastructure and services: Infrastructure should be improved e.g. the sewerage system needs to be improved and a stadium is required in Clarens;
- Conservation of cultural and historical elements: a cultural village should be set up from which locals can showcase their culture and sell their crafts;
- Agricultural zone: There should be areas demarcated for small scale agriculture (livestock, cash crops and grains) within the agricultural zone;
- Conservation of cultural and historical elements: Cultural and historical elements should continue to be conserved. Public access to historical sites that are presently on private farms should be ensured;
- River health: rehabilitation of rivers should take place to control alien vegetation and pollution;
- Energy use: Provision should be made to increase use of electricity in homes in order to reduce the use of firewood and the attendant deforestation. Currently use of firewood is high in Kgubetswane.

Rosendal

- Broad vision for development of the municipality: There is need to improve infrastructure and sanitation in the municipality such as supply of water, electricity, toilets, roads and recreation facilities. Services such as shopping facilities are needed as people currently travel to Senekal to access shopping facilities;
- Targets to water management : Water provided for consumption should be clean.
- River health: Rivers and dams should be cleared of silt and dirt – this is affecting the quality of the water.
- Agricultural zone: The agricultural zone should be demarcated to include areas for small scale farming. Land should be made available in the zone demarcated for small scale farming to residents of Rosendal who would like to farm.

Paul Roux

- Broad vision for development of the municipality: Development in the municipality should address infrastructure and services, for example, water, electricity and sanitation. Provision of water, sanitation and electricity should be maintained in order to support the development of job creating enterprises. Development should also address unemployment and equip people with the skills and financial resources to start small businesses targeted at the tourist market e.g. accommodation and restaurant facilities.
- Urban zone: More land should be made available for housing in the urban zone as there is currently not enough land for housing;
- Ecological/conservation zone: Land should be retained for conservation;
- Conservation of natural open space: Open spaces should be maintained. Spaces outside the township can be used for farming while some open spaces in the township should be used for housing and parks;
- Conservation of cultural and historical elements: There is need for facilities to promote art and culture – for example, there is need for a craft centre for people to sell their crafts and provide entertainment through groups who perform traditional songs and dance.

Comments from officials of Dihlabeng Local Municipality, Free State Department of Economic Development, Tourism and Environmental Affairs and National Department of Environmental Affairs officials.

In addition to the public participation meetings, a meeting was held on 9 December 2009 with officials of Dihlabeng Local Municipality, Free State Department of Economic Development, Tourism and Environmental Affairs and the National Department of Environmental Affairs. The meeting was held at the Dihlabeng local municipality offices in Bethlehem and followed the same format as the public participation meetings held with residents. The minutes of the meeting are in Appendix 5.

Desired state of the environment
Waste Management: waste recycling should be promoted with separation of waste at source – to reduce tonnage of waste getting to landfill sites. There should be recycling sites close to residential areas to allow easy access for domestic waste recycling;

Development pressures and proposed management zones

- The ecological and conservation zones should be clustered together so that the ecological zones create opportunities for conservation;
- A mining management zone should be created - even though currently there is very little mining, this sector has potential to grow in DLM. This zone should be created proactively, taking into account what is being mined and what is yet to be mined;
- Urban management zone: there should be a sub category that would help exclude some activities from the urban areas even during EIA applications;
- Rural areas: they need to be specified;
- The urban zone should also consider housing and infrastructure development and this should be linked to what the SDF has earmarked for housing;
- Tourism should be a distinct management zone. There is development of recreation facilities outside the formal conservation areas. The guidelines on tourism should incorporate what the municipality is doing to deal with tourism.

The following management zones were identified for the EMF:
- Ecological (to include conservation)
- Agricultural
- Urban
- Mining
- Tourism (overlaps with ecological zone)

6. DESIRED STATE OF THE ENVIRONMENT IN DIHLABENG LOCAL MUNICIPALITY

The vision for the environmental future of DLM should be determined locally by the people of DLM. This desired state of environment should, however, also be guided by national legislation, policies and guidelines. An overview of the legal framework within which the Dihlabeng Local municipality EMF would operate is given in section 3 of this document. This section gives an overview of the desired state of environment in DLM and is informed by national legislation and policies, the municipal vision, mission, strategic objectives and aspirations of the people of DLM. The desired state of environment is thus guided by and aligned with the vision, mission, and objectives of the municipality.

The Dihlabeng Local Municipality Integrated Development Plan (2009/2010), page 125 states that the vision of the municipality is „effective service commitment". The mission of DLM is „to provide effective and efficient people centered governance that will facilitate the developmental role of local government". The strategic objectives are:

- To deliver sustainable services;
- To provide quality, accessible and affordable services to all Dihlabeng community;
- To promote social and economic development;
- To create a safe and healthy environment;
- To encourage communication and community participation.

The management objectives in DLM, based on the municipal priorities as listed in the Dihlabeng Local Municipality Integrated Development Plan (2009/2010) and the Dihlabeng SDF (2008/2009) include:

- To discourage urban sprawl;
- Land use change which optimizes use of the natural resource base;
- Responsible use of natural resources;
- The protection and conservation of all environmentally sensitive areas within the municipality;
- The protection of endangered species and all biodiversity;
- Stimulation and optimization of agricultural production;
- Sustainable use and management of tourism resources;
- Protection of riparian areas and wetlands;
- Maintenance of an open space system within the municipality.

The EMF, by supporting developmental decisions seeks to promote strategies which work towards the realization of the strategic and the management objectives and municipal priorities in all aspects of decision making in DLM. In addition to the stated objectives of the municipality which define the desired state of environment broadly, the perspectives of residents of DLM on the more specific aspects of the desired state of environment were sought. Different stakeholders in Dihlabeng were consulted on their vision for the state of environment that they desire as described in section 5 of this document. The key issues which emerged from the consultation were mainly local in nature as people were familiar with and aware of issues at a local level. The issues were consolidated so that they would be more reflective of the situation at the municipal level.

The biophysical environment

Water

- Healthy, unpolluted rivers, clear of alien vegetation;
- Clean rivers clear of silt and garbage.

Biodiversity

- Well conserved biodiversity in DLM.

The socio-economic environment

- Opportunities presented by tourism in Clarens and other towns in DLM are accessible to all people in the towns including those in the townships;
- Services such as shopping facilities available in all urban areas in DLM, including the small towns.

Land use

Open spaces

Open spaces will be maintained in the urban areas of DLM, but residents of the different areas should determine how open spaces are utilized (within municipal provisions) as follows:

- Open spaces are well conserved and well maintained, with natural vegetation (this is desired in Fouriesburg, Paul Roux and Rosendal);

- Where desired by residents, some open spaces are utilized for growing medicinal plants (this is desired in Fouriesburg);

- Some open spaces are utilized as parks, especially in townships where currently there are no parks (this is desired in Fouriesburg, Rosendal and Paul Roux);

- Open spaces on the urban edge are used for growing crops (this is desired in Paul Roux);

- Where permissible, some open spaces are utilised for housing developments (this is desired in Paul Roux).

Agriculture

- The agricultural zone has areas demarcated for small scale farming (crop cultivation and livestock grazing) and residents of townships in the different towns have access to agricultural land and can engage in small scale farming if they so wish;
- Support is available for residents engaging in small scale farming to ensure that production is maintained at high levels and environmental degradation minimised.

Tourism

- There are facilities to promote art and culture such as crafts and song and dance to attract tourists to areas such as Paul Roux where tourism is low;
- Land is available for development of tourism facilities, for example accommodation and restaurants in townships.

Housing

- More land is available for housing in urban areas.

Bulk service infrastructure

- Consistent supply of high quality water is provided to all residents;
- There is increased use of electricity in homes and a decline in use of firewood and deforestation;
- Improved sanitation systems in all urban areas of DLM;
- Increased provision of sports and recreation facilities such as stadiums in townships;
- Improved roads in the municipality.

The cultural environment

- There are cultural villages in DLM from which local people showcase their culture and sell crafts;
- Cultural and historical elements are conserved in DLM;
- There is public access to historical sites that are on private farms.

7. ENVIRONMENTAL MANAGEMENT ZONES

The delineation of environmental management zones is based on combining the baseline information layers contained in the status quo report, current policies and objectives and the desired state of environment as articulated through the DLM vision and consultation with stakeholders. The suitability of an area for development is then determined by transforming the baseline information into secondary information through an analysis of the sensitivity of the area. In DLM, the most important factors to consider for rural and urban development are:

- Sensitive habitats including ridges and natural open spaces;

- Sensitive surface hydrological features such as wetlands and riparian areas;
- Agricultural land (high potential, cultivated lands);
- Natural and cultural heritage sites;
- Endangered grassland vegetation;
- Conservation areas;
- Bulk infrastructure accessibility;
- Potential pollution from agricultural activities, sewage works and other sources;
- The position of the urban edge.

Environmental management zones were determined by considering the factors listed above and environmental constraints and opportunities for the different areas in DLM, based on the data layers. Environmental management zones are areas that have been clustered on the basis of common attributes. These attributes include environmental management priorities identified through the status quo analysis, current land use and stakeholder consultation. The designation of management zones was informed by ecological, economic and social considerations, based on the current and projected future ecological and socio-economic functions of the zone. The information is displayed in data layers in a Geographic Information System (GIS).

One of the key environmental management zones in DLM is the ecological zone. This zone also includes areas under conservation as ecological and conservation functions overlap and this gives the zone both an ecological and conservation function. The ecological zone in DLM is important due to the endangered status of the vegetation in the grassland biome. Areas currently under agriculture were clustered into an agricultural management zone in order to maintain the agricultural potential of the area. Importance is attached to agriculture because of the key socioeconomic role of agriculture as the highest contributor to the Gross Geographic Product of DLM and the largest employer. A tourism zone has been designated and this zone overlaps with some parts of the ecological and urban zones. The DLM IDP and SDF acknowledge tourism as a growth sector with potential to contribute to the growth of the economy of DLM. Although mining is currently a minor activity in terms of land use and contribution to the Gross Geographic Product and employment, DLM stakeholders endorsed the delineation of a mining zone as a proactive strategy to plan for possible future increases in mining activities. A transport corridor was also designated along the N5 highway (one kilometre buffer on either side of the N5).

The environmental management zones for the DLM are shown in Figure 7.1

Zone A: The ecological zone (includes conservation)

The ecological management zone is made up of areas of high ecological sensitivity and these include riparian areas, wetlands, ridges and areas with endangered vegetation. Areas of conservation importance such as gazetted national parks, trans-frontier conservation areas and important bird areas are included in this zone. The ecological management zone overlaps with the tourism zone as tourism developments that are using opportunities that this zone presents are located in this zone. Environmental management priorities in DLM should focus on this zone as this zone is made up of highly sensitive areas. Although the zone is currently utilised for tourism, according to the IDP, SDF and the desired state of environment in DLM, this zone is expected to support further tourism development in the future. The expected and/or planned increase in tourism development in this zone if not managed properly could result in the degradation of the habitat and loss of endangered vegetation. Environmental management in

this zone therefore requires strict adherence to environmental management guidelines including monitoring.

Zone B: The agricultural zone

Although there are no areas of high land capability potential in terms of agricultural development, the important socio-economic role of agriculture in DLM makes it crucial to maintain production in areas which are currently under agricultural production. The maintenance of agricultural production is also important from a national food security perspective as the Free State is one of the country"s most important food producing areas. In the agricultural zone both commercial and small scale agricultural activities are catered for. However, the areas under small scale agriculture (both crop cultivation and livestock grazing) should be expanded as there is demand for land for small scale farming. This would need to be done within the considerations of the SDF. The areas demarcated for small scale agriculture would need to be easily accessible from townships in the five towns as residents of townships expressed a desire to practise small scale agriculture.

Although opportunities for its future physical expansion are limited, the agricultural zone in DLM is expected to accommodate more small scale users. The Dihlabeng SDF (2008/2009) recommends the extension of the municipal commonage (the land earmarked for small scale agriculture) and for it to be located within walking distance of housing developments. The desired state of environment also alludes to the necessity of increasing the area under small scale agriculture. Environmental management in this zone will need to take cognisance of the fact that small scale farmers may not have the knowledge and experience to maintain both agricultural production and the integrity of the natural resource base. Increase in small scale farming activities would thus require the municipality to supervise small scale activities and provide assistance with environmental management. Environmental management would also need to be maintained on the larger scale farms.

The agricultural zone is also linked to tourism opportunities through subdivision of farms and development for tourism. The subdivision of agricultural land and its use for tourism development is supported by both the SDF and IDP of DLM and is set to increase in future. Environmental management in the agricultural zone should plan to cater not only for agriculture related activities, but also for activities related to tourism.

Zone C: The urban zone

The urban environmental management zone incorporates the five urban areas of DLM. The availability of better infrastructure and services in urban relative to rural areas, and better employment prospects in urban areas attract people to urban areas. In DLM, although there is population growth in all five urban areas, the fastest growth is in Bethlehem. This growth in population needs to be considered in planning for development of DLM. Some of the aspects where particular attention needs to be paid include equitable distribution of resources and facilities, urban sprawl, limited opportunities in poor areas and public transportation. Open spaces play and important ecological role as they revolve around the protection and conservation of ecologically sensitive areas and are part of the urban landscape. Careful consideration should be made before the development of open spaces and for the maintenance of connectivity between open spaces and the ecological zone where feasible.

There are opportunities for growth of urban areas in DLM. Growth in all the urban areas, especially in Bethlehem is taking place and will continue in the future. Urban growth has to be planned for and environmental management in this zone will have to deal with the increased demands that growth of urban centres will place on the environment.

Zone D: The N5 Highway Transport Corridor

The N5 highway links DLM with Bloemfontein and KwaZulu-Natal. It also links the DLM towns of Paul Roux and Bethlehem. In the DLM SDF (Dihlabeng SDF, 2008/2009) the highway is

designated a commercial route. The area immediately adjacent to the highway presents opportunities for economic development and activities supported by easy access to a main transport route. Future environmental management in this zone will have to address the environmental needs and consequences of a variety of commercial activities.

Zone E: The mining zone
The main mining activities in DLM are surface based activities of gravel mining and sandstone cutting. There is potential for growth of the mining sector as there are areas such as Fouriesburg which hold sandstone formations with mining potential. This zone caters for both current mining activities and projected future mining. The potential growth in mining needs to be taken into consideration in future development plans of DLM including environmental management plans.

Zone F: Possible expansion zone
This area has low agricultural activity, low conservation significance and low urban spread. It is also close to the R26 for access and transport purposes. The zone presents future opportunities for urban growth and is a potential area for expansion of the urban zone. The urban growth which is and will place pressure in the future on some parts of the ecological zone around Bethlehem could take place in the possible expansion zone. While not a sensitive area, environmental management in this zone has to be planned for maintenance of the natural resource base under urban land use.

The tourism zone (not shown in Figure 7.1)
Tourism opportunities presented by the DLM environment have been exploited as Dihlabeng is a prime tourist destination. The DLM SDF (Dihlabeng SDF, 2008/2009) denotes all five towns in the municipality tourism nodes. The provincial roads such as the road from Clarens to Golden Gate (Provincial Road P31/2) and the Clarens/Fouriesburg road (P51/1) have been designated tourism corridors and tourism related developments are permitted along these routes. There are opportunities for further growth and development of tourism in the designated tourism nodes and in other areas in DLM. Tourism can be a powerful tool for economic growth and employment creation in an area. In addition, tourism can be a catalyst for conservation of ecological areas in DLM as the tourism and ecological zones overlap and the ecological conditions in the ecological zone provide the natural environment which supports tourist activities. In some areas the tourism zone also overlaps with the agricultural zone as farmland is subdivided to provide tourism and recreation facilities.

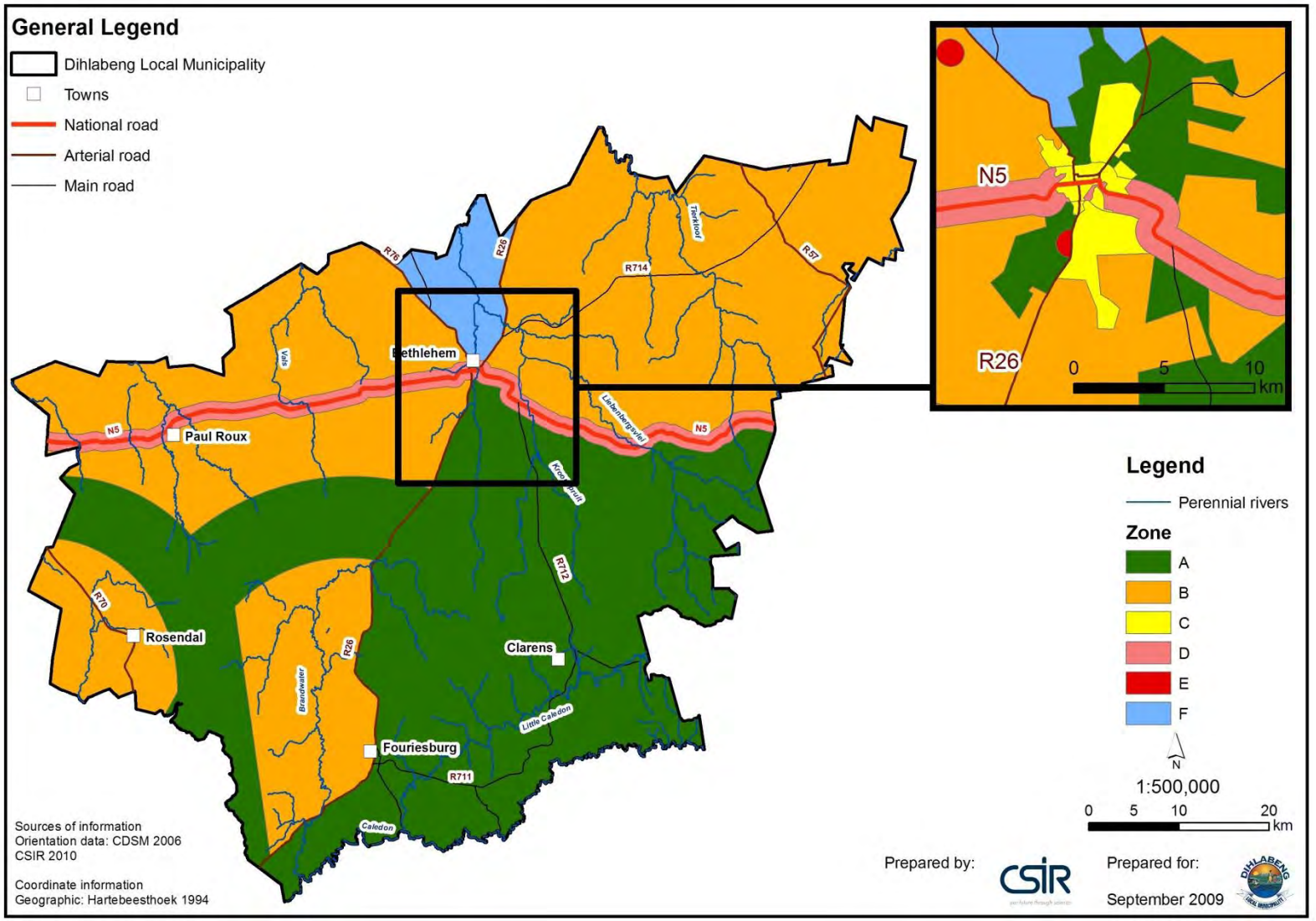

Figure 7.1 Environmental management zones in Dihlabeng Local Municipality

8. SENSITIVITY

A sensitivity scale was derived for determining the sensitivity of different areas of the DLM. Three sensitivity categories: high, medium and low were derived on the basis of criteria identified from the status quo analysis (Table 15). The categorization criteria were derived from the data layers used in determining the environmental status quo of the DLM and the review of documented information on the area. A map of the sensitivity classes of DLM is shown in Figure 8.1.

Table 15: Sensitivity criteria of Dihlabeng Local Municipality

Sensitivity Class	**Sensitivity criteria**
High	• Wetland area • High biodiversity • conservation importance • endangered grassland • Undisturbed natural vegetation • Presence of rare and endangered species • Presence of ridges • Riparian area
Medium	• Disturbed natural vegetation • Agricultural land use • Presence of vulnerable vegetation • patches of endangered grassland within predominantly agricultural areas • Urban areas
Low	• Minimal agriculture • Minimal ecological and conservation importance

The *high sensitivity* area is made up of the ecological zone, incorporating the conservation areas.

The *medium sensitivity* area covers the agricultural zone including patches of endangered grassland occurring in the agricultural zone. This area also has impacts of mining and forestry. All urban areas fall within the medium sensitivity area.

The *low sensitivity* area is the area with minimal agricultural and ecological importance. This area lies to the north of Bethlehem.

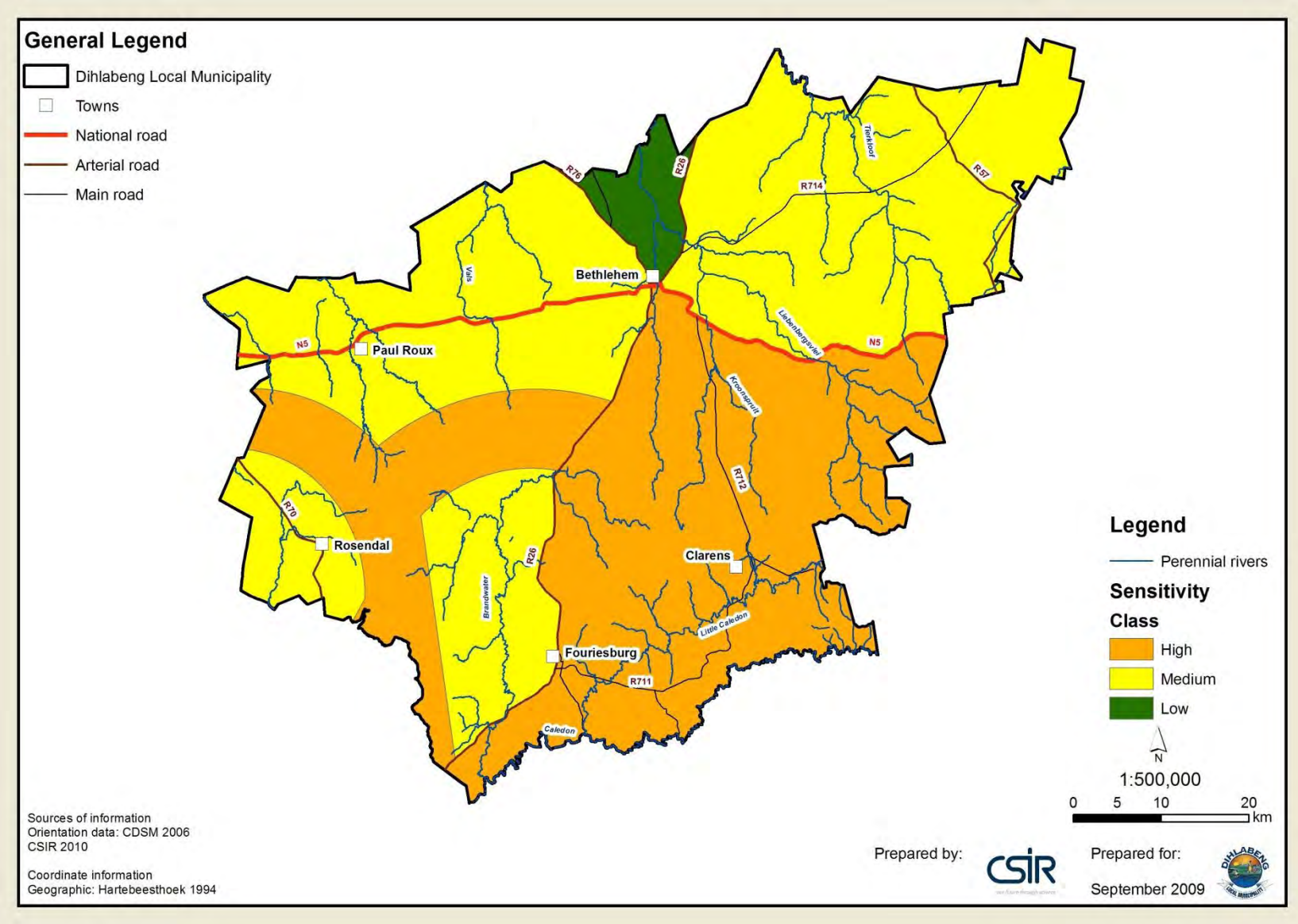

Figure 8.1 Sensitivity classes of Dihlabeng Local Municipality

9. STRATEGIC ENVIRONMENTAL MANAGEMENT PLAN

9.1 Introduction

The Strategic Environmental Management Plan (SEMP) is based on the integration of information from the environmental status quo of DLM, stakeholder consultation and review of policies and legislation and the desired state of environment. The purpose of the SEMP is to give an indication of the suitability of different areas of DLM for various types of land uses and activities. The SEMP informs appropriate land uses and provides guidelines for developments taking place within the environmental management zones based on the attributes of the zones. The SEMP does not, however, prescribe the land use which should take place in certain areas, but highlights the minimum environmental requirements which have to be met before a development can take place. For each environmental management zone, management guidelines are indicated in line with Chapter 8, Regulation 71 of the NEMA regulations (DEAT, 2006) which states that an EMF must indicate:

- The kind of activities that would have a significant impact on the attributes of the environment;
- The kind of activities that would not have a significant impact on the attributes of the environment; and
- The kind of activities that would be undesirable in an area or in specific parts of an area.

The guiding principles of the SEMP are sustainability, equality, efficiency and integration and fair and good governance as alluded to in the Dihlabeng SDF (2008/2009).

9.2 Management guidelines in environmental management zones

There are six environmental management zones in DLM, and these differ in terms of their development and conservation potential, with these differences being determined by current land use and sensitivity. In light of these differences, management guidelines are presented for each environmental management zone. These are meant to support future development so that it does not compromise environmental integrity and occurs within the principles of sustainable development as defined in South African policy (DEAT, 2005b), where sustainable development is defined as: „development that does not use up resources more quickly than they are replaced by natural processes or new technology. It combines concern for the environment with social and economic issues to make sure that human health and natural and cultural resources are not harmed".

The management guidelines indicate which land uses are desirable or not desirable for certain areas and are meant to be used in the evaluation of development applications and in planning. The guidelines can also be used by developers to identify areas of potential conflict between proposed developments and sensitive environments. Developers would then be able to address such identified conflicts upfront in proposals for development. The management guidelines should be used in conjunction with other relevant policies and guidelines.

The ecological zone

The ecological zone is made up of ecologically sensitive habitats and conservation areas. The purpose of this zone is to maintain ecological and conservation functions. If a proposed development falls in this area, the National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) and the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) should be referred to. In addition, local development and conservation plans for the area should be consulted. Development in this zone should aim to:

- contribute to biodiversity protection and enhancement of the ecological and or conservation status of the area;
- contribute to the conservation of natural resources;

- maintain ecosystem functions and services in the area.

a) Land uses and activities that would be desirable in this zone without further assessment include:

- Nature based tourism;
- Conservation and recreation activities that would not be disruptive to the ecology of the area.

b) Land use and activities that may be permitted subject to environmental authorization in terms of NEMA regulations and to meeting the other conditions of the EMF include:

- Conservation related facilities and infrastructure;
- Essential infrastructure such as roads, rail and pipelines.

c) Land uses and activities that should not be permitted irrespective of where they occur in the zone include:

- Residential developments;
- Industrial and commercial developments;
- Agricultural activities;
- Landfill sites and sewerage treatment works;
- Mining activities;
- Cemeteries;
- Golf course and golf course developments.

The agricultural zone

The agricultural zone is made up of a variety of agricultural land uses. These different agricultural land uses should be maintained as agriculture plays an important socio-economic role in DLM. Agriculture is, however, threatened by other land uses such as tourism and urban development. Considerations for change in land use from agriculture should not only be based on financial returns, but should also consider the country"s food security needs. Small scale agriculture should be supported in the vicinity of high density residential areas to enable residents to meet their food and cultural needs through crop cultivation and livestock grazing. Activities in this zone should be managed in accordance with the relevant legislation and guidelines such as the Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983); National Water Act, 1998 (Act No 36 of 1998, as amended) and other regulations.

a) In this zone, land uses and activities that may be permitted without seeking environmental authorization include:

- Rain-fed crop cultivation;
- Irrigated crop cultivation where the requisite water use rights have been satisfied;
- Livestock rearing including dairy farming;
- Livestock grazing.

Agro industrial activities such as abattoirs, feedlots and agro-processing plants should not be permitted in this zone.

b) Land use and activities that may be permitted subject to environmental authorization in terms of NEMA regulations and to meeting the other conditions of the EMF and DLM planning provisions include:

- Agricultural infrastructure such as dams, farm buildings;
- Agriculture related commercial activities such as warehousing, grading and packing facilities;
- Retail activities to serve the farming communities;
- Agro industrial activities;
- Essential infrastructure such as roads, water reticulation etc.

In the agricultural management zone, subdivision of land for conservancies, leisure, residential and other developments related to tourism and leisure use should be permitted subject to registration of a reversion phrase and other conditions being met.

c) In this zone, the activities which should not be permitted include:

- Industrial and commercial developments;
- Housing developments.

The urban zone

The five towns in DLM fall into this zone. This zone provides retail, commercial, administrative, residential, industrial and recreation services and facilities. Mixed land uses in accordance with local plans such as the IDP and SDF should be supported. Open spaces should be maintained in this zone for recreational purposes and for the protection of ecologically sensitive areas. Only developments which take cognisance of the ecologically sensitive areas and the open space system should be permitted.

a) In this zone, desired land uses subject to environmental authorization in terms of NEMA and other regulations include:

- Residential developments;
- Commercial developments and office parks;
- Retail developments and shopping facilities;
- Industrial developments;
- Infrastructure development;
- Manufacturing, warehousing, bottling and packaging facilities.

b) Activities which should not be permitted in this zone include:

- Mining;
- Agriculture.

The mining zone

The mining zone incorporates activities such as quarrying, extraction of minerals and brick manufacturing. The purpose of this environmental management zone is to confine mining activities to designated areas in order to contain the environmental and health impacts of the activity. This zone incorporates both current mining activities and projected future activities. Activities which should be permitted in this zone subject to environmental authorization in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) and NEMA, as well as other legislation and polices include:

- Prospecting, mining, quarrying and extraction;
- Infrastructure and buildings associated with mining related activities;
- Storage of ore and other materials pertaining to mining;
- Manufacturing of coke and bricks;
- Manufacturing of cement.

Activities which should not be permitted in the mining environmental management zone include:

- Residential developments;
- Commercial developments and office parks;
- Retail developments and shopping facilities.

The tourism zone

This is not a stand alone zone as it overlaps with the ecological and urban zones. In some parts of the zone the ecology of the area underpins the environmental conditions on which tourism is based. The purpose of this zone is to maintain the integrity of the ecological zone while deriving social and economic benefits from the zone. Tourism growth is a priority in DLM and the development of tourist infrastructure and facilities contributes to economic growth and creation of employment opportunities.

a) Land use and activities which may be permitted in areas where the tourism environmental management zone overlaps with the ecological zone, subject to environmental authorization in terms of NEMA, the provisions of the SDF, the Physical Planning Act, (Act No. 88 of 1967) and other regulations include:

- Construction and/or refurbishment of infrastructure and facilities for hospitality and recreation purposes such as restaurants, lodges and hotels;
- Establishment of sport and recreation facilities associated with tourism activities;
- Subdivision of land to accommodate tourism activities;

b) Activities which may not be permitted in this overlap zone include:

- Residential developments;
- Industrial and commercial activities.

c) Where the tourism zone overlaps with the urban zone, developments related to tourism should be guided by the urban development guidelines.

The N5 transport corridor

The corridor along the N5 highway should be used for a mix of commercial activities that require easy or fast access to a transport route. The highway links Bethlehem with Paul Roux and also links DLM to neighbouring KwaZulu-Natal.

a) Desired activities in the corridor, subject to environmental authorization include:

- Agro-processing and packaging;
- Manufacturing, bottling and packaging;
- Warehousing and storage facilities;
- Various industrial activities;
- Commercial activities.

b) Activities which should not be permitted in the development corridor include:

- Agriculture;
- Heavy industries with potential noxious impacts.

The expansion zone

This zone is a potential mixed land use zone. If a decision is taken to use the zone for the expansion of Bethlehem then the planning provisions for the town should be applied in accordance with local plans such as the IDP and SDF.

a) In this zone, desired land uses subject to environmental authorization in terms of NEMA and other regulations include:

- Residential developments;
- Commercial developments and office parks;
- Retail developments and shopping facilities;
- Industrial developments;
- Infrastructure development;
- Manufacturing, warehousing, bottling and packaging facilities.

c) Activities which should not be permitted in this zone include:

- Conservation;
- Agriculture.

9.3 Development guidelines based on sensitivity categories and criteria.

Development considerations in DLM will need to take into account the environmental management zone into which a proposed development falls and also consider in detail the site specific environment using the sensitivity categories and criteria where applicable.

Ecological zone

If a development falls in this zone, the following would be required:

- EIA including ecological specialist studies undertaken by a professional registered ecologist. Biodiversity and ecosystem service value of site must be established;
- A site development plan that gives detail on factors likely to impact on the ecological integrity of the site e.g. the vegetation that will be permitted, type of fencing etc. should be included;

- Where the site lies adjacent to a wetland, an aquatic ecological study should be conducted. The 1:100 year floodline would have to be determined and indicated on the site development plan;

- Evidence of how the connectivity between the site and other ecologically important sites will be maintained should be included in the development plan.

Agricultural zone
A development falling in the agricultural zone would require:

- An assessment of the agricultural potential of the site including a soil assessment undertaken by a specialist;

- An economic assessment of the agricultural enterprises that the land can support should be conducted by an agricultural/resource economist.

Tourism zone
If a development falls in the ecological section of the tourism zone, the following would be required:

- EIA including ecological specialist studies undertaken by a professional registered ecologist. Biodiversity and ecosystem service value of site must be established;

- A site development plan that gives detail on factors likely to impact on the ecological and conservation integrity of the site e.g. the vegetation that will be permitted, type of fencing etc should be included;

- Where the site lies adjacent to a wetland, an aquatic ecological study should be conducted. The 1:100 year floodline would have to be determined and indicated on the site development plan;

- Evidence of how the connectivity between the site and other ecologically important sites will be maintained should be included in the development plan.

Developments falling in the urban section of the tourism zone should be guided by the applicable urban environmental requirements for the type of development concerned.

Urban zone
Developments in the urban zone should meet the provisions of NEMA and comply with the relevant municipal plans and policies.

Mining zone
Developments falling in this zone, will have to meet the relevant NEMA, Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) and the Mines and Works Act (Act No. 17 of 1956) provisions. In addition, due to the prevalence of fossils in DLM, specialist studies conducted by experts on fossils should be done and EIAs that address impacts on fossils will be required before mining operations are authorized.

N5 Transport corridor
Developments in the N5 transport corridor should be guided by the relevant NEMA provisions and the applicable municipal plans and policies.

Expansion zone
If the expansion zone is utilised, developments falling into this zone should be guided by the relevant NEMA provisions and the applicable municipal plans and policies.

9.4 General development guidelines

Alignment of EMF with DLM plans and policies
An EMF is not meant to be a stand alone tool, but should be used in conjunction with other municipal plans and policies. It is, therefore, important to align the EMF with municipal plans. Until such time that the EMF is incorporated into the SDF, reference should be made to the SDF each time a development is considered. This will ensure that the development is supported by and fits into the DLM‟s planning objectives. Reference should also be made to the DLM‟s IDP in order to ensure that the proposed development conforms to the general planning goals and strategies at both local site and municipal level.

Compliance with DLM policies
A development should also be assessed in light of relevant municipal policies, and reference should be made to these policies to inform the consideration process. Policies such as the open space system would have implications for developments that fall within the open system while outdoor advertising policies would affect developments which entail putting up signage.

Other considerations
Developments spanning more than one zone: for developments which impact on more than one environmental management zone, it is necessary to assess alignment considerations to cater for connectivity of the natural areas.

Alignment with DLM environmental management plans: Developments have to be aligned with DLM environmental management plans which would be currently applicable.

Access to bulk services: Availability of services in or around the site of a proposed development should be ascertained with the relevant authority, including capacity constraints and how the proposed development would impact on demand levels. Where services such as water, sanitation and electricity are not provided in the area of a proposed development, arrangements should be made to access services while adhering to environmental and health standards. For water, investigations will be required to ascertain availability of required quantities of water, and whether that water meets human health standards if it is intended for human consumption. For sanitation, the capacity of the area to sustain facilities such as sceptic tanks would have to be ascertained. Where electricity is not supplied, alternative energy sources that are not harmful to the environment should be investigated.

Servitudes: It is necessary to ascertain whether or not there are servitudes (both existing and planned/registered) on the land on which a development is proposed. Local authorities and service providers should be consulted on this.

Visual Impact: The requirements for visual impact assessments within a predetermined buffer of a protected area as set out in management plans for specific protected areas would have to be fulfilled. In DLM this requirement would apply for developments in the ecological and tourism zones. For developments in all the other zones, consultation with DLM would be necessary to ascertain whether or not a visual impact assessment is required.

Heritage features and sites: If a development falls in an area with a known heritage site or feature, SAHRA should be consulted for advice on appropriate management and mitigation measures. In situations where a development is likely to alter a heritage site or feature, a heritage impact assessment should be undertaken by a heritage specialist in consultation with SAHRA.

Compliance with provincial and national policies and legislation

Some of the standards that developments in the different environmental management zones will have to meet are set at provincial and national level. In addition to referring to municipal level regulations, reference should be made to the relevant national legislation and policies to ensure compliance. Some of the issues which would require application of national and/or provincial level legislation and policies in DLM are listed below. The list is, however, not exhaustive and for each proposed development, it must be ascertained that all relevant legislation has been complied with.

Noise: Based on the nature of a proposed development and the surrounding land use, the requirement for a noise impact assessment should be decided on the merits of each individual project. Where a noise impact assessment is deemed necessary, this should be undertaken by a noise impact assessment specialist in accordance with the relevant legislation and regulations. The assessment would have to address both nuisance and disturbance factors based on the legislated permissible noise levels. National level regulations which would be applicable include:

- Section 25 of the Environmental Conservation Act, 1989 (Act No. 73 of 1989);
- South African National standard SANS 10103:2003;
- South African National standard SANS 10210 (SABS 0210);
- South African Bureau of standards Code of Practice SANS 10328 (SABS 0328).

Invader plants: If the proposed development involves the introduction and/or management of plants, the requirement for an ecological or biodiversity assessment would have to be decided depending on the individual project factors. Legislation governing the planting and destruction of certain plant species would have to be adhered to. National legislation which would be applicable includes:

- The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
- The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

Use of water: Where a development will make use of water (either ground or surface), or involve the diversion of water or activities affecting water in some way, in addition to DLM regulations, reference has to be made to the National Water Act, 1998 (Act No. 36 of 1998) to ensure compliance.

Pollution of water: Where there is a chance that a development might cause water pollution such as through sceptic tanks, as part of the requisite EIA, specialist studies conducted by a specialist aquatic expert would be required. In addition to meeting municipal level regulations, the provisions of the National Water Act, 1998 (Act No. 36, 1998) which deal with pollution would have to be adhered to.

*Air pollution: W*here a development entails activities which may result in air pollution, specialist air pollution studies should be conducted as part of an EIA. The provisions of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) would have to be met.

Summary of policies, guidelines and strategies of relevance to development guidelines in DLM.

The legislation, policies and strategies which inform development guidelines in DLM are summarized in Table 16. The Constitution of the Republic of South Africa, 1996 (Act No 108 of 1996) underpins the legislation, policies and strategies.

Table 16. Legislation, policies and strategies which inform development guidelines in DLM.

Legislation/policy /strategy	Level
National Environmental Management Act (NEMA), 1998 (Act No 107 of 1998)	National
Environmental Conservation Act (Act No 73 of 1989)	National
National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)	National
National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)	National
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)	National
EIA Regulations in terms of NEMA (July 2006, GN385,386,387 published in Government Gazette on 21 April 2006)	National
Mountain Catchment Areas Act, 1970 (Act No. 63 of 1970)	National
National Water Act, 1998 (Act No. 36 of 1998)	National
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	National
Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	National
Mines and Works Act (1956) Act no. 17 of 1956	National
National Heritage Resources Act, 1999 (Act No. 25 of 1999), and provincial regulations	National
Physical Planning Act, 1967 (Act No. 88 of 1967)	National
South African National Standard (SANS) 10103 (Noise)	National
South African National Standard (SANS) 10210 (SABS 0210) (Noise)	National
South African National Standard (SANS) 10329 (SABS 0328) (Noise)	National
Revised Free State Growth and Development Strategy (FSGDS 2007-2014)	Provincial
Free State Growth and Development Strategy (FSGDS 2005-2014)	Provincial
Free State Tourism Authority Act, 2005 (Act No. 3 of 2005)	Provincial
Nature conservation Ordinance 8 of 1969, assigned to Free State Province with effect from 17 June 1994 under Proclamation 113 of 1994, published in government Gazette 15813	Provincial
Free State Provincial Government Department of Tourism, Environmental and Economic Affairs Strategic Plan (current)	Provincial
Dihlabeng Local Municipality IDP (2009/2010)	Municipal
Dihlabeng Local Municipality SDF (2008/2009)	Municipal
Dihlabeng Local Municipality Proposed New Town Planning Scheme	Municipal
Dihlabeng Local Municipality Information Document: Rezoning	Municipal
Bethlehem Town Planning Scheme	Municipal

9.5 Implementation, monitoring and evaluation

The primary responsibility for implementing management guidelines in each environmental management zone rests with Dihlabeng Local Municipality. In areas which are under private ownership and/or management, although the land owners would have primary responsibility for ensuring adherence to management guidelines the municipality would have to ensure that the individual land owners/managers are implementing the guidelines. Based on the objectives and management guidelines for each management zone, it is necessary to periodically assess whether or not the management objectives are met and whether the state of environment is commensurate with the management objectives. A system for monitoring and evaluating the

state of environment relative to the management objectives is required. Such a system would be underpinned by appropriate indicators. A monitoring and evaluation system would help the DLM and different stakeholders keep track of changes in the state of environment. This would ensure that appropriate corrective action can be taken in a timely way. A framework for implementation, monitoring and evaluation of the management guidelines in DLM is presented in Table 17.

Table 17. Framework for implementation of management guidelines and monitoring and evaluation of the state of environment in DLM

Management zone	**Environmental Management Objective**	**Responsibility for implementation of management guidelines**	**Indicators**	**Monitoring**	**Evaluation**
Ecological	Biodiversity protection and enhancement	(1) Dihlabeng Local municipality (2) Private land owners	Red data species of flora and fauna	Conduct counts of identified red data flora and fauna in specific marked areas twice a year	Compare counts at each monitoring period with previous counts to establish trends. Target is to get an increase in Red data flora and fauna over time
	Enhancement of conservation status of area	(1) Dihlabeng Local Municipality (2) Private land owners	Species of endangered grassland flora	Conduct counts and assess health of identified species of endangered grassland flora in fixed sample plots twice a year	Compare counts and health of species at each monitoring period with previous measurements. Aim to increase numbers and health of endangered species
	Maintenance of ecosystem functions and services	(1) Dihlabeng Local Municipality (2) Individual land owners	Water quality in rivers/dams in the ecological zone	Measure water quality parameters quarterly	Compare parameters at each evaluation with parameters at previous evaluations and establish trend. Aim to improve water quality parameters over time
Agricultural	Maintenance of different agricultural land uses	(1) Dihlabeng Local Municipality (2) Farmers	Area in hectares under different agricultural uses	Tally of hectares under different agricultural uses once every year	Compare hectares at each tally with previous periods to establish trends. Aim is to arrest a consistent reduction in land under agricultural use
	Having small scale agricultural land in the vicinity of high density residential areas	(1) Dihlabeng Local Municipality (2) Local councillors	Area in hectares under small scale agriculture in each town	Tally of hectares under small scale agriculture once every year	Compare hectares at each tally with previous periods to establish trends. Aim is to maintain or increase area under small scale

					agriculture
	Maintenance of environmental integrity in areas under agricultural land use	Dihlabeng local municipality Farmers	Ground water quality Soil quality Soil erosion	Measure soil and water quality parameters at designated sampling points twice a year	Compare parameters at each sampling with parameters at previous samplings and establish trends. Aim for a consistent improvement in parameters
Urban	Maintaining environmental integrity through: Maintenance of open spaces; Protection of ecologically sensitive areas such as wetlands and riparian areas.	(1) Dihlabeng Local Municipality (2) Developers (3) Residents	NEMA provisions for different developments and operations. Environmental Management Plans for different operations	Assess compliance of developments or operations with NEMA provisions and Environmental Management Plans (EMPs) where present on an annual basis or as per EMPs	Determine changes in compliance rates over time. Aim for a consistent increase in compliance
Mining	Confining mining activities to designated areas in order to contain the environmental and health impacts of mining; Maintaining environmental integrity.	(1) Dihlabeng Local Municipality (2) Mining companies	Mining activities and their location Environmental impacts of each mining activity	Tally of mining activities, their location and environmental impacts as stated in EIA documents Monitor adherence to EMPs where applicable	Assess compliance with NEMA provisions and adherence to EMPs over time. Aim for an increase in compliance and adherence over time
Tourism	Maintaining integrity of the environment while deriving social and economic benefits	(1) Dihlabeng Local municipality (2) Tourism operators	Record of each licensed tourism operation and its nature and anticipated environmental impacts	For each development monitor factors likely to impact on ecological and conservation integrity as stated in EIA documents; Monitor compliance with NEMA regulations.	Over time establish trend in terms of compliance with NEMA/EIA regulations. Aim for increasing compliance over time
N5 transport corridor	Providing transport infrastructure while maintaining integrity of the environment	Dihlabeng Local Municipality	NEMA provisions for different developments and operations; Environmental Management Plans for different operations	Assess compliance of developments or operations with NEMA provisions and EMPs where present on an annual basis or as per EMPs	Determine changes in compliance rates over time. Aim for a consistent increase in compliance
Expansion zone	Providing mix of land uses for	Dihlabeng Local Municipality	NEMA provisions for	Assess compliance of	Determine changes in

	social and economic benefit while maintaining integrity of the environment		different developments and operations; Environmental Management Plans for different operations.	developments or operations with NEMA provisions and EMPs where present on an annual basis or as per EMPs	compliance rates over time. Aim for a consistent increase in compliance

10. DATA AND INFORMATION GAPS IN THE EMF

This EMF is low resolution and provides broad scale strategic information. This is as a result of lack of scale appropriate data and information to enable the compilation of a high resolution EMF. The process of doing the status quo analysis for this EMF revealed that there are significant information gaps in DLM in terms of baseline information relating particularly to biodiversity, agriculture and heritage. Due to the size of DLM, it would not have been possible given the time frame and budget of the EMF to collect the requisite information for the compilation of a high resolution EMF.

Biodiversity
The biodiversity and ecological information that was available was national level information and provincial level information as given in the Free State Province State of the Environment Report. Local level information used in conjunction with specialist studies would have made it possible to delineate areas of different ecological sensitivity and to provide specific management guidelines for these different areas.

Heritage
There is no detailed heritage information on DLM. The status quo section of the EMF lists heritage sites in DLM, based on the review of non-specialist information. Due to budgetary constraints, it was not possible to conduct heritage studies as part of this EMF. Detailed heritage studies would have made it possible to delineate areas of different heritage sensitivities and to give specific management guidelines for the different areas.

Agriculture
The EMF made use of information on land capability and areas under specific crops to arrive at agricultural land use. In the absence of appropriate provincial level information on variables such as agricultural potential, it was not possible to delineate sensitivity zones in the agricultural area of DLM and thus to give specific management guidelines for different areas based on agricultural potential.

11. ACTION PLAN FOR IMPLEMENTING THE EMF

Understanding the EMF
For the EMF to be useful and effective as a decision support tool, the end users of the tool have to be familiar with it and aware of its capabilities and limitations. The users of this EMF include officials of the DLM, district and local government officials, landowners, developers, civil society organizations and other environmental interest groups. The first step in getting users to be aware the EMF will be to hold a workshop to launch the EMF. At the launch workshop the EMF will be presented to users in general terms, highlighting what the tool can and cannot do. The launch workshop will be followed by specialist workshops targeted at municipal and provincial officials and consultants to demonstrate the GIS aspects of the EMF. These workshops will be held to ensure that those who will use the EMF on a regular basis fully understand the basis of

the EMF. Training should also occur on an ongoing basis in both DLM and the Free State Department of Economic Development, Tourism and Environmental Affairs to ensure that all staff who need to use the EMF have the skills to do so.

Incorporating the EMF into DLM planning instruments

To streamline decision making and planning the EMF should be mainstreamed into DLM planning through incorporation into the IDP and SDF. Such incorporation would ensure that the provisions of the EMF are reflected in the DLM plans and guide the planning processes upfront. Such an approach would ensure that the EMF is not inadvertently left out of decision-making.

Updating the EMF

The EMF is based on the current environmental status quo in DLM and the current plans, policies and aspirations. With time, the factors forming the basis for the EMF will change. Whenever changes occur or more information becomes available on any aspect covered in the EMF, the EMF should be updated. The EMF should also be reviewed at scheduled intervals so that stakeholders can contribute information and are aware of revisions.

Step-by- step process for using the EMF

For the developer:

1. Determine the environmental management zone in which a proposed development falls (using environmental management zone map);
2. Identify activities in zone; i.e.

a) activities which are permitted and the conditions attached

b) activities which are not permitted

3. On the basis of identified activities from no. 2 above, incorporate appropriate actions or activities in proposal - this could for example result in development of an Environmental Management Plan (EMP) or modification of activities associated with the development;
4. Determine the sensitivity of the area in which the development falls and identify activities required (EMP, specialist studies etc.) and incorporate into proposal.

For the authorities

1. Receipt of development proposal;
2. Determine the environmental management zone in which development falls using the environmental management zone map;
3. Determine whether the proposed activity is permitted in the zone (if not reject proposal), If permitted proceed to 4;
4. Determine the conditions that have to fulfilled for development to take place;
5. Ascertain that proposal meets conditions or request fulfilment of conditions e.g. full EIA.
6. Assess proposal.

12. APPENDICES

APPENDIX 1: REFERENCES

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APPENDIX 2: SITES VISITED DURING GROUND TRUTHING

Description of sites visited during ground truthing in DLM. Photographs of some sites are shown at the bottom of the table as indicated by the photograph number in the description of the site. Dates of ground truthing: 18-22 February 2008.

Date	Lat	Long	Description of Area	Sensitive Areas	Opportunities	Degradation	Picture
22-Feb	-28.21181	28.29672	Bethlehem Industrial Area				
22-Feb	-28.24847	28.07161	Built-up area, farm houses on left. Cultivation all around				Photo1
22-Feb	-28.16933	28.08347	Cultivation on the left. Natural grassland on the right				Photo 2
22-Feb	-28.14436	28.10367	Maize fields on the left and hay rolls on the right. Alien invasive species next to maize fields				Photo 3
22-Feb	-28.13367	28.10969	Fallow land and farm houses. Maize fields, still well cultivated area.				Photo 4
21-Feb	-28.21883	28.33781	Water reservoirs (3) on the left and uncontrolled waste dumping on the road side (waste dumped: debris from construction sites). 700m ahead on left side, parking area for road construction vehicles and old buses. Scattered residences in this area and about 1km ahead on right,			Uncontrolled waste dumping: mostly debris from construction sites	Photo 5

			structured residential area. Vegetation at this point: natural grassland.				
21-Feb			Brakenpark township on the left side of R714 coming from Bethlehem. Clinic and shopping areas inside township.				
21-Feb	-28.07775	28.43317	Natural grassland. Maize fields on the left and bean fields across about 200m from maize field. Small dams on left, one next to maize fields and one next to bean fields. Built-up area on the right with alien trees and bare patches of land.			Opportunity for soil erosion on bare patches of land but not heavily eroded.	Photo 6
21-Feb	-28.09428	28.45381	Bean fields on left and maize fields on right with a few eucalyptus and wattle trees on right road-side. Farm-house 1.5km ahead (right) with trees behind. Small built-up area with stick-and-mud houses on left, believed to be farm-workers' homes.				Photo 7
21-Feb	-28.09911	28.45631	Bridge over a stream.			Severe gulley erosion on river-banks of the stream	Photo 8
21-Feb	-28.20675	28.33092	Inside residential area, Bohlokong			Lots of bare patches of	Photo 9

			township.			land, typical of township residences - sheet erosion, a common occurrence. A few scattered waste dumps and pieces of waste lying around.	
21-Feb	-28.13242	28.34211	Maize fields on right. Left: fruit plantation and small dam also newly cultivated land.				Photo 10
21-Feb	-28.09022	28.35453	Maize fields all around. Hill with a few rock outcrops on left, 100m from maize field.				
21-Feb	-28.10181	28.40931	Dam on left, next to alien trees. Maize field on right with a border of alien trees.				
21-Feb	-28.11139	28.67150	Maize fields on right - lots of good maize. Fallow cultivated land on left with small dam.				
21-Feb	-28.16231	28.68258	Maize fields on left. Natural grassland on right and maize fields all over.				
21-Feb	-28.23192	28.70536	Maize fields on left. Built-up area with small dam before you get to it. Grassland all round with some eucalyptus trees 300m ahead.				
21-	-	28.34358	Solid waste				Photo11

Feb	28.16536		dump/landfill site on the left side of the road coming from Bethlehem, maize fields 1km ahead. Natural grassland and alien eucalyptus trees.				
21-Feb	-28.11336	28.56708	Cultivation all around				
21-Feb	-28.05658	28.54150	Natural grassland and cattle grazing, fields of dry maize 500m ahead. Stream crossing the road with wetland vegetation along the stream.			Bad soil erosion on the road sides, need to implement erosion control otherwise will become gulley erosion.	Photo 12
21-Feb	-28.06417	28.63778	Bean fields on the right and maize fields on the left. Small dam next to bean fields. Hay bales next to maize fields. Maximum use of available land-good.				
21-Feb	-28.03039	28.60761	Big wetland on the left but no typical wetland vegetation. Maize fields all around and there's a small wetland on the right surrounded by maize fields.				
21-Feb	-28.19358	28.63319	Alien invasive species on the left and maize fields on the right as well as				

			other alien trees, eucalyptus.				
21-Feb	-28.19175	28.58792	River, signs of overgrazing on river (sheep grazing). Natural grassland all over and maize fields 800m ahead on the right.			Severe gully erosion on river bed, stream/river inside the gulley.	Photo13
21-Feb	-28.16858	28.58061	Small hill with rock outcrops by railway line, stream with gulley erosion. Natural grassland all around.				
21-Feb	-28.14392	28.72908	T-junction. Wetland 200m ahead at T-junction wetland vegetation fallow land and beans/maize fields.				
21-Feb	-28.18625	28.70756	Alien trees on the left by road-side. Bean fields on the right.				Photo14
21-Feb	-28.20889	28.69883	Maize silos on left, natural grassland around. This is a built-up area.				Photo15
21-Feb	-28.20661	28.65092	Bean fields, alien eucalyptus trees.				
21-Feb	-28.03678	28.68392	Wetland on left, plenty of wetland vegetation and bird-life. Maize fields around wetland, cattle grazing.				
21-Feb	-28.06597	28.71597	Wetland on left, plenty of bird-life. Maize fields on left.			Gulley erosion on edges of wetland - check underlying	

						geology probably sandstone because nothing observed to be inducing erosion.	
21-Feb	-28.08858	28.73728	Severe gulley erosion on left. Stream/river inside gulley and trees but gulley really bad.				Photo16
21-Feb	-28.17469	28.42772	Fruit orchards on the left and right. Cultivation all over and natural grassland				
21-Feb	-28.13825	28.55953	Maize silos, natural grassland around.				
21-Feb	-28.12053	28.59844	Sunflower seeds all around				
21-Feb	-28.08806	28.64539	Deep dam on the left and another water body - shallow water 500m from the deep dam, maybe natural wetland. Sunflower fields on right.				
21-Feb	-28.19331	28.35461	River with well vegetated wetland vegetation, indigenous trees along the river.				
21-Feb	-28.18622	28.37047	Blue carports (dark on spot image). Building with braai stands outside - building looks abandoned. Ladder and satellite dish but not sure what types			Sheet erosion on bare land.	

			of activities happen here.				
20-Feb-08	-28.28428	28.64928	Electric substation on the left (N5 to Bethlehem). Bean crops on left side.				
20-Feb-08	-28.23322	28.20672	Cultivated fields.	Water table very close to the surface.		Severe gulley erosion, active gulley in the midst of cultivated fields.	
20-Feb-08	-28.29083	28.43606	Maize fields and grassland, cattle grazing 2km ahead on left.				
20-Feb-08	-28.30467	28.57233	Grassland and mountain, residential area 200m on the right along N5.				
20-Feb-08	-28.28700	28.60211	Natural grassland.				
20-Feb-08	-28.38036	28.06208	Big gulley erosion on left. See picture				
20-Feb-08	-28.36458	28.10978	Maize fields all around.				
20-Feb-08	-28.27728	28.09406	Maize fields. Acacia trees, eucalyptus and other invasive tree species.				
20-Feb-08	-28.20031	28.21003	Maize silos 200m behind. Sunflower fields 300m on the left and maize fields 600m ahead on the right.				
20-Feb-	-28.38939	27.95200	Fallow land/grassland around. Mountain				

08			with rock outcrops and shrubs, cultivation 1km on the right.				
20-Feb-08	-28.40428	27.97969	Maize fields and grasslands.			Severe gulley erosion (about 2km away from this point), following a down slope of the mountain route.	
20-Feb-08	-28.39372	28.02325	Maize fields all around.			Sheet erosion on road side	
20-Feb-08	-28.38889	28.03439	Gulley erosion with maize fields on top of gulley - pic			Gulley erosion	
20-Feb-08	-28.38553	28.04950	Mountains on the left, maize fields on the right. Acacia shrubs on road-side..				
20-Feb-08	-28.50700	27.93069	Same as spot image, inside Rosendal Township				
20-Feb-08	-28.41103	27.87492	Maize fields on the left, fallow land on the right and mountains 500m ahead with building on top.				
20-Feb-08	-28.37317	27.89169	Gulley erosion.		Gulley re-vegetating	Severe gulley erosion on the right going down slope from the mountain, looks active. Caused by heavy rainfall, check	

						underlying geology.	
20-Feb-08	-28.33217	27.93428	Gulley erosion.			Severe gulley erosion on both sides of the road, cattle grazing on the right	
20-Feb-08	-28.30897	27.90600	Quarry on the right, grassland with hay bales on the left.				
20-Feb-08	-28.31083	27.85961	Alien eucalyptus trees and maize fields, generally grassland. Hills with rock and shrubs 1km away.				
20-Feb-08	-28.48314	27.89156	Grassland, maize fields 1km ahead and sunflower.				
19-Feb-08	-28.26722	28.36314	Dam on the left of N5, plenty of bird-life				Photo17
19-Feb-08	-28.24514	28.25506	Cultivation all around, dam on the left.				
19-Feb-08	-28.27169	28.07561	Electric transformer on the right, alien trees and cultivation on left.				
20-Feb-08	-28.28267	27.98754	Gulley erosion.			Big gulley erosion, re-vegetating - not sure what induced it, check underlying geology.	
20-Feb-08	-28.29958	27.94914	Inside Paul Roux town.				

19-Feb-08	-28.69275	28.23539	Caledonspruit border post - to Lesotho. Mountains all round				
19-Feb-08	-28.63769	28.25208	Wetland on the left and mountains. Cultivation is the main land-use.				Photo18
19-Feb-08	-28.54925	28.41728	Beautiful mountains on right, cultivation and grazing on the left.			Some erosion occurs on mountain slopes but erosion patches re-vegetating	
19-Feb-08	-28.51992	28.41664	Inside Clarens, intermediate school inside a built-up area. Popular cave paintings in area, mountain climbing, beer brewing and other tourist favourable activities.			Patches of bare land and erosion on dust roads.	Photo19
19-Feb-08	-28.43947	28.39722	Lesotho Highlands Water project. There is a cloud over this area on the spot image.				
19-Feb-08	-28.36203	28.38319	Fruit plantations on the left, maize cultivation ahead on the right. Built-up area - farm houses, sheep rearing 2km ahead.				
19-Feb-08	-28.56850	28.13167	Maize silo				
19-Feb-08	-28.53169	28.13169	Maize fields parallel to railway line. Fruit nursery 3km away.				

19-Feb-08	-28.67067	28.12344	Maize fields		Gaps of land at field ends, can maximise profit by reducing these and cultivating all the available land.		
19-Feb-08	-28.68611	28.12489	Wetland on the left, hills with rock outcrops on the right.	Sensitive wetland habitat, plenty of bird-life.			
19-Feb-08	-28.76278	28.05389	Edge of municipality, mountains and cultivation.				
19-Feb-08	-28.62806	28.19919	Solid waste transfer station				
19-Feb-08	-28.62286	28.19506	Inside residential area, Mashaeng township. Waste dump right behind this residential area with burning waste heaps.				Photo20
19-Feb-08	-28.18417	28.04228	Open area with evidence of digging for plaster sand. River on the left with well established wetland vegetation. Rail on the front.	Wetland vegetation	Can be professionally managed by municipality in order to control who and when plaster sand is collected from this site.	If not well managed erosion can occur because of digging, however, properly covered by grassland for now.	Photo21
19-Feb-08	-28.26250	28.30328	Quarry on the right, dam on the left.	Well vegetated area, big wetland			

				area around the dam.			
19-Feb-08	-28.29447	28.28761	Fruit orchards on the right, maize fields on the left - huge orchards				
19-Feb-08	-28.36175	28.25508	Fruit orchards on the right, mountains with rock outcrops and indigenous trees around a stream. Lots of alien trees on the outskirts of the fruit orchards. Fallow land on the left with good grassland.				
19-Feb-08	-28.46878	28.19811	Crop spraying for dry beans - fungicide sprayed to kill rust. Chemicals used: • methomyl 900, • alpha cypermethrin 100EC, • Biofiln, Copper Count - N (liquid fungicide) and • Armistar: All bought from Hosman spraying. Aerial spraying done only for beans, spraying for maize done by a tractor on the ground and applied with the seeds at planting.				Photo22
19-	-	28.17958	Fruit plantation on the	wetland			

Feb-08	28.52997		right, hay fields on the left and wetland with wetland vegetation.	vegetation			
19-Feb-08	-28.60772	28.19694	Tsepano primary school on the left within a residential area (township) with lots of littering/waste thrown all over, fallow land on the right.		Fallow land can be cultivated profitably or used for residential purposes.		
19-Feb-08	-28.59783	28.17894	Gulley erosion with small stream within in well vegetated grassland. Grass growing inside the eroded area so erosion stabilising but walls of gulley exposed. Dam at the foot of the gulley, fields across.	Threat to the road, might collapse if gulley erosion extends, also telephone lines would collapse if gulley extended.		Cattle grazing at the top of the gulley, might worsen gulley erosion and extend it upwards.	
18-Feb	-28.24194	28.15833	Dam and maize fields on the right, residences on the left.	Wetland habitat around the dam	Dam can be used for irrigation.		Photo23
18-Feb	-28.17467	28.26003	Dam on the left and built-up area behind. Maize fields and livestock farming	Well established dam with wetland vegetation and plenty of bird-life. Indigenous trees around the stream			
18-Feb	-28.24181	28.27897	Livestock farming on the left eucalyptus				

			(alien) trees on the right and farm houses. Rock outcrops on hills 2km away.				

DIHLABENG LOCAL MUNICIPALITY GROUND TRUTHING - PHOTOGRAPHS

Photo 1: Lat: -28.248847, Long 28.07161 Description: Built-up area, farm houses on left. Cultivation all around

Photo2: Lat:-28.16933, Long 28.08347 Description: Cultivation on the left. Natural grassland on the right

Photo 3: Lat -28.14436; Long 28.10367 Description: Maize fields on the left and hay bales on the right. Alien invasive species next to maize fields

Photo 4: Lat-28.13367 Long 28.10969 Description：Fallow land and farm houses. Maize fields, still well cultivated area

Photo 5: Lat -28.21883 Long: 28.33781 Natural grassland , uncontrolled dumping

Photo 6: Lat: -28.07775; Lomg: 28.43317 Description: Natural grassland. Maize fields on the left and bean fields across about 200m from maize field. Small dams on left

Photo 7: Lat: -28.09428; Long 28.45381 Description: Bean fields on left and maize fields on right with a few eucalyptus and wattle trees on right road-side

Photo 8: Lat -28.09911; long 28.45631; Description: Bridge over a stream

Photo 9: Lat -28.20675; Long 28.33092 Description: Bohlokong Township, Bethlehem

Photo 10 : Lat -28.13242; Long: 28.34211 Description: maize fields and fruit orchards

Photo 11: Lat -28.16536; Long 28.34358; Description Solid waste dump/landfill

.

Photo 12: Lat: -28.056658; long 28.54150; Description Natural grassland and cattle grazing, fields of dry maize 500m ahead. Stream crossing the road with wetland vegetation along the stream

Photo 13: Lat: -2819175; Long 28.58792 Description River, signs of overgrazing on river (sheep grazing). Natural grassland

Photo 14: Lat -28.18625; Long 28.7075756 Description: Alien trees on the left by road-side. Bean fields on the right.

Photo 15: Lat -28.20889; Long 28.69883 Description: Maize silos on left, natural grassland around. This is a built-up area.

Photo 16: Lat: -28.08858; Long 28.73728: Description: Severe gulley erosion on left. Stream/river inside gulley and trees but gulley really bad.

Photo 17: Lat -28.26722; Long 28.36314; Description: Dam on the left of N5, plenty of bird-life"

Photo 18: Long: -28.63769; Long 28.23539 Description: Wetland on the left and mountains. Cultivation is the main land-use.

Photo 19: Lat -28.51992; Long 28.39722; Description : Clarens town –intermediate school

Photo 20: Lat -28.62286; Long 28.19506; Description: Mashaeng township

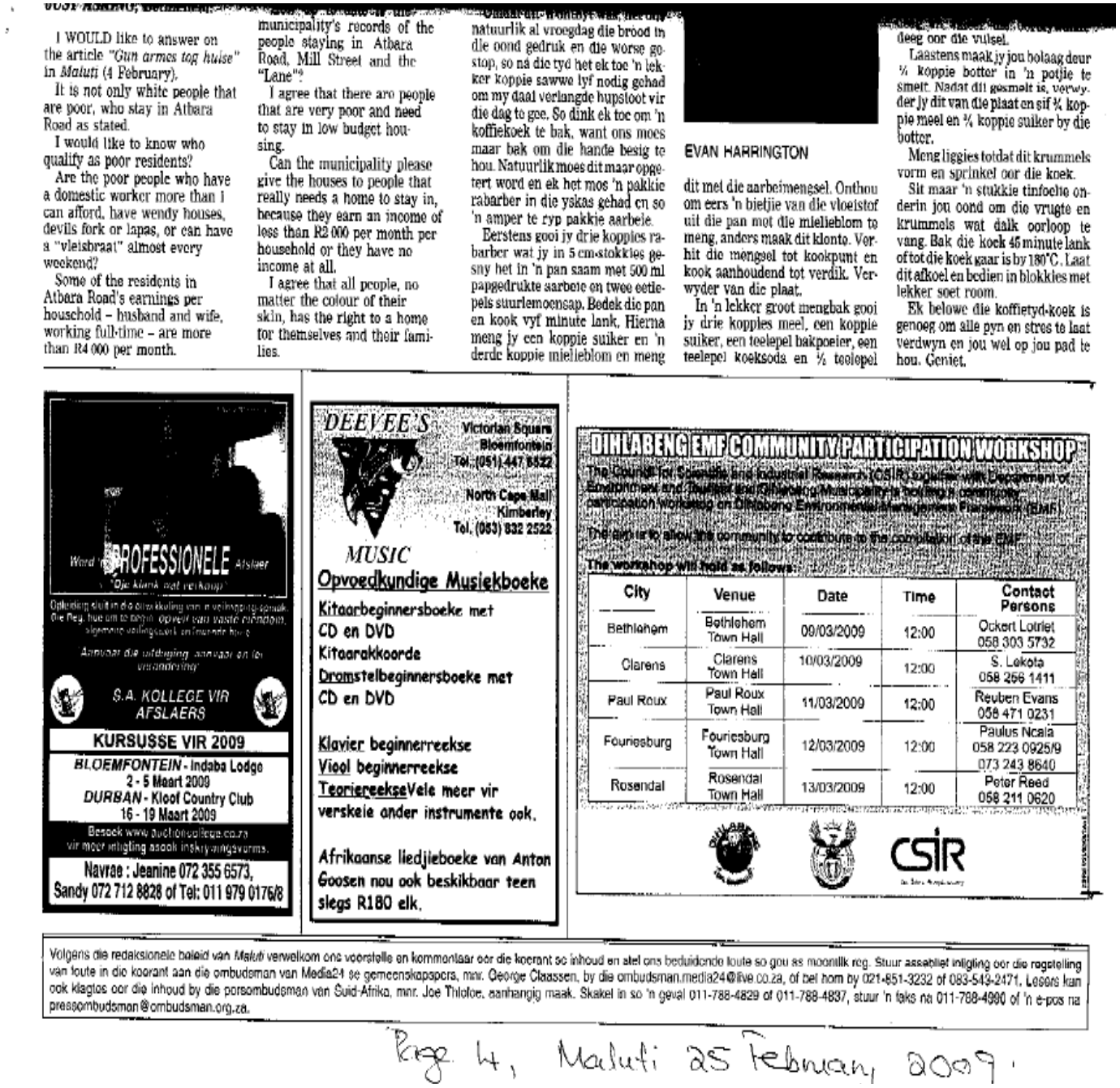
Photo 21: Lat: - 28.18417; long 28.04228; Description: Open area with evidence of digging for sand. River on the left with well established wetland vegetation. Rail on the front.

Photo 22: Lat: -28.46878; Long 28.19811 Description: Crop spraying

Photo 23: Lat -28.24194; Long 28.15833 Description: Dam and maize fields on the right, residences on the left.

APPENDIX 3: PUBLIC PARTICIPATION - AWARENESS OF THE EMF AND ENVIRONMENTAL ISSUES IN DIHLABENG LOCAL MUNICIPALITY, MARCH 2009

Advertisements for public participation meetings held in March 2009:



I WOULD like to answer on the article *"Gun armes tog huise"* in *Maluti* (4 February).

It is not only white people that are poor, who stay in Atbara Road as stated.

I would like to know who qualify as poor residents?

Are the poor people who have a domestic worker more than I can afford, have wendy houses, devils fork or lapas, or can have a "vleisbraai" almost every weekend?

Some of the residents in Atbara Road's earnings per household – husband and wife, working full-time – are more than R4 000 per month.

municipality's records of the people staying in Atbara Road, Mill Street and the "Lane"?

I agree that there are people that are very poor and need to stay in low budget housing.

Can the municipality please give the houses to people that really needs a home to stay in, because they earn an income of less than R2 000 per month per household or they have no income at all.

I agree that all people, no matter the colour of their skin, has the right to a home for themselves and their families.

natuurlik al vroegdag die brood in die oond gedruk en die worse gestop, so na die tyd het ek toe 'n lekker koppie sawwe lyf nodig gehad om my daal verlangde hupstoot vir die dag te gee. So dink ek toe om 'n koffiekoek te bak, want ons moes maar bak om die hande besig te hou. Natuurlik moes dit maar opgetert word en ek het mos 'n pakkie rabarber in die yskas gehad en so 'n amper te ryp pakkie aarbeie.

Eerstens gooi jy drie koppies rabarber wat jy in 5 cm-stokkies gesny het in 'n pan saam met 500 ml papgedrukte aarbeie en twee eetlepels suurlemoensap. Bedek die pan en kook vyf minute lank. Hierna meng jy een koppie suiker en 'n derde koppie mielieblom en meng

EVAN HARRINGTON

dit met die aarbeimengsel. Onthou om eers 'n bietjie van die vloeistof uit die pan met die mielieblom te meng, anders maak dit klonte. Verhit die mengsel tot kookpunt en kook aanhoudend tot verdik. Verwyder van die plaat.

In 'n lekker groot mengbak gooi jy drie koppies meel, een koppie suiker, een teelepel bakpoeier, een teelepel koeksoda en ½ teelepel

deeg oor die vulsel.

Laastens maak jy jou bolaag deur ¼ koppie botter in 'n potjie te smelt. Nadat dit gesmelt is, verwyder jy dit van die plaat en sif ¾ koppie meel en ¾ koppie suiker by die botter.

Meng liggies totdat dit krummels vorm en sprinkel oor die koek.

Sit maar 'n stukkie tinfoelie onderin jou oond om die vrugte en krummels wat dalk oorloop te vang. Bak die koek 45 minute lank of tot die koek gaar is by 180°C. Laat dit afkoel en bedien in blokkies met lekker soet room.

Ek belowe die koffietyd-koek is genoeg om alle pyn en stres te laat verdwyn en jou wel op jou pad te hou. Geniet.

Figure AP 3.1 Advertisement which appeared in the Maluti, 25 February 2009

Briewe Lesers
Posbus 21/ PO Box 21 Bethlehem 9700

Dienslewering in chaos

JURIE STEYN, Paul Roux:

MUNISIPALE bestuur verg 'n professionele geestesingesteldheid om elke dag beter te wil presteer as die vorige. Dit geld bestuur en selfs toesig op alle vlakke. Indien nie, het dit 'n sneeubal-effek op alle funksies van 'n plaaslike bestuur.

Munisipale dienste, veral ook in Dihlabeng, is oor die algemeen swak en in sommige gevalle skokkend en selfs afstootlik, soos onder meer vuil drinkwater en riool wat in strate loop. Verswarend is dat die munisipale bestuurder, mnr. Sandile Msibi, strydend met sy amp op 'n arrogante wyse besonder ontoeganklik en ongeduldig is ten opsigte van formele besware.

Dit is nie slegs 'n skending van sy amp en status nie, maar heeltemal onversoenbaar met professionele bestuursbeginsels, veral waar dit met aanvaarbare gemeenskapswaardes verband hou. Alle amptenare ly weens die gebrek aan professionele leierskapshoedanighede in hul onderskeie lynfunksies.

'n Kroniese klaagsiekc gemeenskap (terog al dan nie) is ook in 'n mate aandadig aan die onwenslike situasie soos die geval is.

Dit is nie net te wyte aan sinnelose gekef nie, maar veral ook aan die soms belaglike plaaslike politickery soos onder meer met die aanleg van die reeds drie jaar oue ongebruikte stortingterrein neffens die N5 op Paul Roux. Intussen loop riool langs die vuil strate af. Die strate was nog nooit in so 'n swak toestand soos nou nie.

Dit is duidelik dat dienslewering in chaos verkeer.

Besorgdheid flous nie

DR. ASTRID JANKIELSOHN, Bethlehem:

DIE berig *Dierehospitaal wys glo hond weg* (*Vrystaat*, 19 Februarie) verwys.

Mnr. Johan Strydom se poging om sy beeld in die gemeenskap te verbeter flous nie. Komende van iemand wie se saak dit is om honde te misbruik om ander diere te jag en dood te maak is sy besorgdheid oor sy hond net nie oortuigend nie. Watter kriteria gebruik Strydom om te besluit dat een dier spesiale sorg nodig het en ander vir wins doodgemaak moet word?

Dra feesvierings op aan werkers

HERMAN LATEGAN, Kaapstad:

DAAR is nie juis baie om oor opgewonde te raak met die 350ste bestaansjaar van die wynbedryf in Suid Afrika nie.

Die wynbedryf is berug daarvoor, veral tot so onlangs as 15 jaar gelede, dat hulle die werkers op hul plase soos weggooislawe en onderworpenes behandel het. Terwyl die boere lekker gold gemaak het, is die werkers so min betaal dat hulle skaars daarvan kon oorleef.

Om nie eens van die dopstelsel te praat nie – dit het grootliks bygedra tot die toename in alkoholisme en

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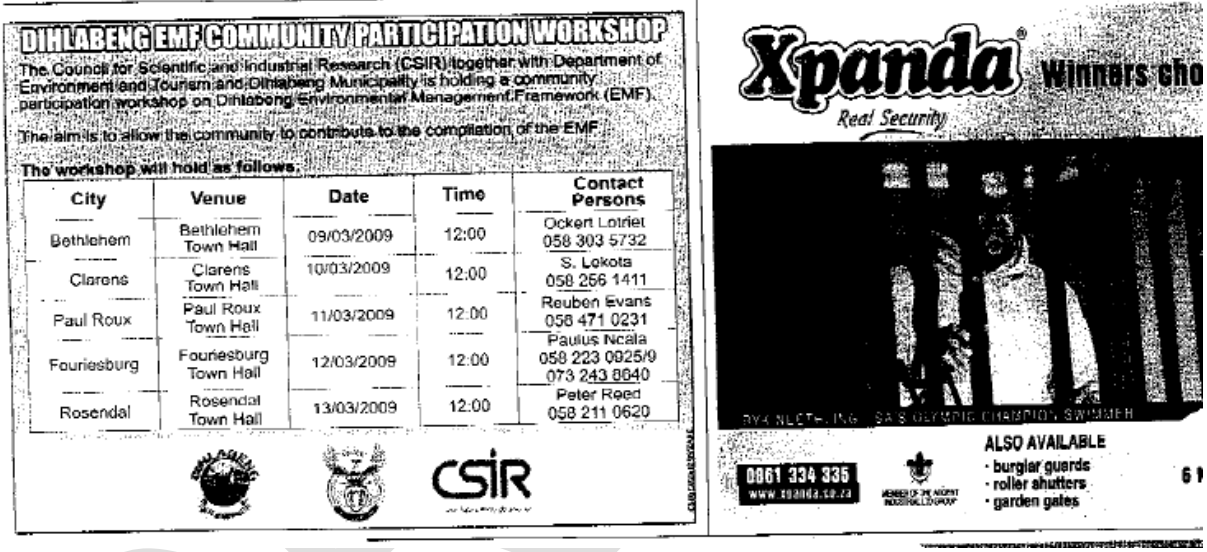

Figure AP 3.2 Advertisement which appeared in the Vrystaat, 26 February 2009

Dihlabeng public participation report: Awareness of the EMF and environmental issues in Dihlabeng Local Municipality, 9 to 13 March 2009.

***1. Bethlehem* public meeting**

Date: 9 March 2009

Place: Bethlehem Town Hall

Number of attendees from Bethlehem: 72 (See appended list of attendees and contact details)

The meeting opened with a presentation by Nikky Adeyemo of CSIR on the preparation of the status quo report and the draft status quo report. This was followed by a discussion which covered the following:

Environmental issues

7. State of dumping sites – rubbish not dumped properly, but strewn around. It was suggested that dumping sites should have security guards – to enforce appropriate dumping and report improper dumping;
8. There is water pollution in Ward 7 – the dumping site is close to source of water for domestic use;
9. Soil erosion caused by waste laundry water thrown on the ground, taps and broken pipes is a problem in ward 7;
10. Ward 17 (farming area) – Storage tank for drinking water is open on top and litter falls into the water;
11. Pit latrines – residents have to clean out pit latrines – in the past a pit latrine cleaning service used to be provided but is now no longer provided;
12. Grass is not cut in residential areas;
13. Litter is a major problem in residential areas;
14. Graveyards are unkempt – families no longer able to identify their relatives" graves;
15. Open spaces in the townships are bushy and unkempt and are a security risk for residents as criminals hide in these areas;

Desired state of Environment

1. Lawns around houses;
2. Paved roads in residential areas (townships);
3. Having flowers, trees and shrubs in residential areas;
4. Utilise open spaces in townships for parks – unemployed youth can work on establishing the parks;
5. Recreational facilities such as tennis courts and playgrounds in township residential areas;
6. Electricity in houses – electrification of houses would lower cost of living as cost of paraffin is higher compared to electricity. Electrification would also improve safety of residential areas;
7. Secured and cleared open spaces which do not compromise the safety and security of residents;

2. Bethlehem meeting with municipal managers and councillors

Date: 10 March 2009

Place: Bethlehem Municipal Offices

Number of attendees: 8 (See appended list of attendees and their contact details)

Following a presentation on the draft status quo report, the following issues were raised in a discussion session:

- Water quality needs to be included in the status quo report, but no information was available – DLM (Angela) to provide contact details of district water officers who carry out routine water analyses to the CSIR EMF team – the team to contact the officers for data on water quality;
- Land invasion for informal settlement is a big problem in Dihlabeng;
- Agriculture- difficult for communities to access land for agricultural use;
- Pesticide and chemical use is high in the agriculture sector – could be affecting the environment, but no documentation.

Desired state of environment

Waste Management

- Waste recycling – there should be separation of waste at source – to reduce tonnage of waste getting to landfill sites;
- There should be recycling sites close to residential areas – easy access for domestic waste recycling.

Town Planning

- Better implementation of plans is needed- documented plans are satisfactory but their implementation needs to be improved;
- Improvement of environment in townships – upholding of planning standards and land use controls;
- To make townships appealing residential areas;
- To have neighbourhood development programmes in place for townships – to attract investment and achieve urban renewal;
- Focus is on previously disadvantaged communities.

3. Clarens Public Meeting

Date: 10 March 2009

Place: Clarens Community Hall

Number of attendees from Clarens: 7 (See list of attendees for names and contact details)

The meeting opened with a presentation on the draft Status Quo Report highlighting the information in the report and gaps.

Discussion

Mr Louw van Biljon indicated that he would make the following documents available to the CSIR team for use in finalising the status quo report:

- Clarens SDF;
- Clarens Strategic Environmental Assessment;
- Clarens Conservancies Environmental Management Plan;
- Clarens Recycling Project document.

Environmental Issues in Clarens

- Poaching of indigenous flora for medicinal uses.
- Poaching of animals.
- Land degradation due to overgrazing – too many cattle on community land and these cattle are sometimes grazed in the conservancy during periods when grazing is insufficient – as a consequence, soil erosion is a problem and is visible both on the community land and in the conservancy.
- Water pollution due to illegal dumping and problems with municipal sewage treatment.
- Although Clarens is not an agricultural area, there is a community agricultural project under the municipality which might be impacting on the environment.
- Illegal dumping, especially of building rubble is common.
- Air pollution due to veld fires and household fires.
- Lack of resources to maintain hiking trails in conservancies.
- Invasive alien plants are a problem – Department of Water Affairs and Forestry contracted people to remove the invasive plants, - programme not entirely successful – led to environmental problems such as collapse of river banks when the plants were removed. An additional problem with the programme is the lack of follow up removal of coppice growth – the invasive plants were only cut once and the herbicide treatment done was ineffective. A better solution to the invasive alien species problem is needed;
- Shortage of firewood in the long term – currently the species removed for firewood are invasive aliens, however, removal of these species encourages their increase through coppicing. With increased demand for firewood as the population increases, the invasive plants are likely to be exhausted and indigenous species will be under pressure;
- Lesotho Highlands Water Project- currently this has no environmental impact but there were impacts during tunnel construction –further information can be obtained from the company which constructed the tunnel – TCTA.
- Discharge of water from tunnel into Ash river has increased flow of water in the river – this has resulted in increased erosion and there are signs of silting of Sol Plaatje Dam.

Desired state of environment

- More recycling to reduce the problem of litter- need to expedite and increase current recycling programme;
- Support of municipality in Clarens environmental initiatives e.g. use of transfer site;
- Litter and land pollution need to be controlled to preserve the aesthetic value of the area and to maintain tourism;
- The full vision of the Clarens community for their environment is given in the Conservancies Environmental Management Plan which will be made to available to the CSIR team.

4. Paul Roux public meeting

Date: 11 March 2009

Place: Paul Roux Community Hall

The meeting did not take place as no one turned up for the meeting. The venue of the meeting was the community hall, but it was unavailable as it was being used for identity card application.

5. Fouriesburg public meeting

Date: 12 March 2009

Place: Fouriesburg Community Hall

No of participants: 137

Environmental Issues in Fouriesburg

12. Deforestation- trees are being cut for firewood as people cannot afford other fuels;
13. Soil erosion – Fouriesburg is hilly with steep slopes, therefore soil erosion is a problem. The problem is exacerbated by lack of storm water drainage systems – roads are washed away;
14. Waste disposal and dumping sites:
    - Not enough rubbish containers are provided in the open spaces for waste disposal in the township;
    - There are several illegal waste dumping sites in the township – the sites are not secured and are accessed by children and this poses a health hazard;
    - The dumping sites are a source of bad smells;
    - The dumping sites are a source of conflict among residents as they are a source of odours and residents residing close to the sites have disagreements with those dumping rubbish close to their homes;
15. Open holes in areas around the township - traditional healers dig up medicinal plants but do not cover up the holes they create – the holes are a danger to people and livestock;
16. Damage to water pipes – water pipes in the township are very shallow and get damaged during road maintenance operations – water is lost and the water also causes soil erosion;
17. Water shortages – the township experiences water shortages periodically, - water is especially a problem when the Caledon River dries up- this exposes residents to disease risks. It was noted that there is a reserve dam to supply Fouriesburg when water is not available from the Caledon River;
18. Dirty water – the water supply to the township is sometimes dirty – the water pipeline to the township is being upgraded and this could be the cause of the dirty water;
19. Cattle kraals in the residential area – some township residents keep cattle and have built kraals in the residential area. Odours from the dung make the environment unpleasant. During the rainy season mosquitoes breed in the cattle kraals;
20. Litter – littering is a problem in the townships and it is compounded by children removing plastic paper from manholes and leaving it on the streets
21. There is a big hole from past quarrying activities is in the township and this poses a danger to residents especially children. The hole is also a source of bad smells as residents sometimes throw dead pets into the hole;
22. Illegal sand mining is causing environmental degradation.

Desired State of environment- Fouriesburg

1. Improved waste management
    - Dumpsites should be fenced off to keep children away from them.
    - The recycling centre should be operational to reduce the amount of rubbish going to dumpsites.
    - Collection centres for recyclable materials should be set up – currently people do not know where to take recyclable materials.
    - Littering should be controlled.
2. Creation of parks – there are many open spaces which are currently not utilised or are used for illegal waste dumping – these should be converted into parks.

3. Residents desire to have a greater number and variety of trees in the township– the Department of Environmental Affairs and Tourism should provide residents with trees for planting in the township.
4. Environmental awareness should increase – initiatives to increase environmental awareness among residents (both adults and children) should be initiated e.g.

- Environmental clubs – to address various environmental issues in the community and to exchange knowledge and information on other important environmental issues such as climate change.
- Information pamphlets to educate the public about the environment e.g. distinctions between invasive alien trees and indigenous trees so that people know which trees to cut for firewood and which to conserve.

Lists of Attendees

1. Bethlehem public participation meeting: 9 March 2009

Name	Address	Phone No
1. Sibongile Mbele	38 Atbara Weg, Morelig	0789861810
2. Mafelleng Mbele	18 Atbara Weg Morelig	083 9995430
3. Montsheneng Mofokeng	35 joubert Street. Morelig	0788654562
4. Elizabeth Ramailane	557 Ext. 1	
5. Busisiwe Tshabalala	6036 Ext 1	0781147605
6. Lipud Mokoena	1975 Lebeko street	0731473467
7. Nozindaba Tseledi	32 Kobus smith	0837179038
8. Mofusi Motleung	14 Retief Street	0732288732
9. Poppy Mzimande	33 Joubert Street	0731907503
10. Matsidiso Mokhohlane Moorosi	10 Kobus Smith	0782323379
11. Morwesi Mokoena	4882 Ext 2	0769827241
12. Mofokeng Maleshwane	7057 Ext 2	0738353805
13. Makoko Emily	944 Ext 1	07879221494
14. Sthandane Mofokeng	Bonnington	0784830704
15. Ratebe Mamasonto	7639 Motsekuwa	0715428765
16. Motsitsi Ntaoleng	A19 Selahliwe	0768380982
17. Masantaha Lesaoana	NR 274 Phola Park	0786008118
18. Makahlolo Mthembu	NR 243 Phola Park	0790366928
19. Mahlaba Matseleng	NR 242 Phola Park	0729379268
20. Ratebe Tlaleng	7584 Motsekuwa	0797385484
21. Mzizi Tlaleng	NR 242 Phola Park	0842144035
22. Elizabeth Zwane	Omdraai	
23. Mabikwe Dieketseng	NR 165 Phola Park	0845627434
24. Ntabiseng Mmako	28 Atbaro	0783321285
25. Mabathelezi Pule	18 Joubert Street	
26. Tebello Twala	8 Helmand	0719181027

27. Mpho Zondo	35 Joubert	0710287935
28. Nomvule Mabuya	1 Hill street	0798596670
29. Tsotetsi Matshidiso	1 Hill Street	0731764405
30. Lefulesele Majalle	Utopia	0733558958
31. Duduzile Radebe	43 Joubert Street	0731126695
32. Ntabiseng Molibeli	32 Joubert Street	0730788846
33. Julia Mbele	5371 Ext2	0583041136
34. Miya Thabo	53 Motaung Street	0838854670
35. Ntabiseng Molibeli	52 Joubert Street	0730788846
36. Makgala Masauce	R84 Pho-Park	0781434333
37. Malejoetsa Mabula	6544 Naledi	0761565971
38. Masello Molopi	6843 Naledi	0738976987
39. Mamello Senkoto	6876 Naledi	0730024561
40. Thembisile Mahlobo	6876 Naledi	0788407784
41. Manana Mokoena	6702 Naledi	0760488558
42. Ntabiseng Mofokeng	319 Coetzee Street	0728544736
43. Mapitso Mofokeng	530 Mlangeni	0738504283
44. Maletsatsi Mkwanazi	1805 Tshabalala	0843720727
45. Nokufa Mkwanazi	1634 Mkhonza	0744340264
46. Mashinini Sibongile	1139 Devilliers	0729003419
47. Matlaletsa Mkopane	1 Joubert Street, Morelia	0837662540
48. Big Boy Maseko	34 Helmand Street	0764008566
49. Pontso Mabine	689 Ext 1	0784720565
50. Masesi Radebe	1542 Motsekuwa	0761604739
51. Ntsoaki Mokoena	1338 Phekolong Street	0840115193
52. Cynthia Mofoku	2023 Thejane Street	0829638658
53. Mamoitheri Lehobo	1177 Koppie Alleen	0730456972
54. Maki Mathibela	1159 Koppie Alleen	0736547356
55. Matshediso Mlangeni	7956 Jacket View	0721542491
56. Noapi Mashinini	1139 Devilliers	0791860233
57. Sosoire Mokoena	331 korstsiea	
58. Mpusetseng Mofokeng	358 Ootip	
59. Tebello Radebe	415 Medican Street	0727484309
60. Sibongile Mokoena	1004 Ext 1	0739166558
61. Mofokeng Ntabiseng	750 Ext 1	0738547090
62. Lungelwa Hlungwane	710 Ext 1	0794675908
63. Mzizi Nomvula	556 Ext 1	0712843880
64. Mr L. Tuki Mota/Maisoane	12 Atbara Road	0736143499
65. ManbzaMafokeng	1420 Danzig Plot	0748444261
66. Tsovetsi Matsnidiso	1 Hill Street	0731764409

67. Dikeledi Lesuoa	7231 Ext 2	0765673401
68. Mamoya Selepe	1420 Danzig Plot	0745749115
69. Mantoa Nhlapo	51 Morrung 91079	0721513179
70. Lucky Malakoane	1505 Tshabalala Street	0723578163
71. Moratua Moloi	NR 76 Phola Park	0767223042
72. Malelekoa Mngomezulu	1808 Tshabalala Street	0767202115

2. Bethlehem Meeting with municipal managers and councillors: 10 March 2009

Name	Designation	Phone No/email
Pule Khiba	Dihlabeng Municipality, Manager Budget and Expenditure	PKhiba@dihlabeng.co.za
M. Mchunu	Dihlabeng Municipality, Manager Town Planning	tpmanager@dihlabeng.co.za
L.P. Ncala	Dihlabeng Municipality, Unit Manager, Fouriesburg	0582230964 (fax)
Sibusiso Morare	Dihlabeng Municipality Audit Manager	auditor@dihlabeng.co.za
Justice Potsane	Dihlabeng Municipality, Manager IDP	jpotsane@dihlabeng.co.za
Sipho Mpetsheni	Dihlabeng Municipality, Manager Supply Chain	mpetsheni@dihlabeng.co.za
Lebohang Moshwaliba	Dihlabeng Municipality, Agricultural Development Officer	lmoshwaliba@dihlabeng.co.za
Angela Mosima	Dihlabeng Municipality, Manager Solid Waste	commserv@dihlabeng.co.za
C. Musvoto	CSIR – EMF Project team	cmusvoto@csir.co.za
O. Adeyemo	CSR-EMF Project Manager	oadeyemo@csir.co.za

3. Clarens Public Participation meeting: 10 March 2009

Name	Organisation	Phone Number
Amos Miya	Clarens Conservancy-Field Ranger	0824302206
Eben Mofokeng	Clarens Conservancy -Field Ranger	0739528720
Ezaiah Miya	Clarens Conservancy -Field Ranger	0833369062
Tshweu Motlumy	Reporter	0736461536
Louw van Biljon	Clarens Conservancy	0827772647

Rodney Wainwright	Clarens conservancy	0836807770
S. Lekota	Dihlaben Municipality-Unit Manager, Clarens	0825151250

APPENDIX 4: PUBLIC PARTICIPATION MEETINGS: PRESENTATION OF THE ENVIRONMENTAL STATUS QUO REPORT AND CONSULTATION ON THE DESIRED STATE OF ENVIRONMENT IN DIHLABENG LOCAL MUNICIPALITY

Dihlabeng Local Municipality public participation meetings, 7- 11 December 2009

Advertisement of the meetings

Public participation meetings to highlight the key environmental elements of DLM as documented in the status quo report and to discuss the desired state of environment were advertised in three local newspapers, the „Maluti", „Vrystaat" and „Free State Business Bulletin". These newspapers are distributed at no cost to readers in DLM and other parts of the Free State province. The full advertisement as it appeared in the newspapers is displayed below:

"DEVELOPMENT OF AN ENVIRONMENTAL MANAGEMENT FRAMEWORK (EMF) FOR DIHLABENG LOCAL MUNICIPALITY

1. REVIEW AND COMMENT ON ENVIRONMENTAL STATUS QUO REPORT

CSIR Natural Resources and the Environment is facilitating the development of an EMF for Dihlabeng Local Municipality, and hereby informs Dihlabeng stakeholders that the environmental status quo report is available for review during the period 23 November 2009 to 15 January 2010.

a) Copies of the report will be available at
   - Bethlehem Public Library
   - Dihlabeng Local Municipality Offices, Bethlehem (Municipal Manager"s Office)
   - Fouriesburg Municipal Office (Mr P. Ncala)
   - Clarens Municipal Office (Mr Lekota)
   - Paul Roux Municipal Office (R. Evans)
   - Rosendal Municipal Office (P.Reed)

b) The report can also be viewed and downloaded from: http://www.csir.co.za/nre/sustainability_science/index.html

The comment period will run from 23 November 2009 to 15 January 2010. Stakeholders who would still like to register as interested and affected parties can do so during this period. To register please contact Mina Anthony on 021 888 2504 or MAnthony@csir.co.za . Comments on the report can be sent to Miriam at CSIR on 012 841 3391 or mmurambadoro@csir.co.za.

2. PUBLIC MEETINGS FOR SUBMITTING COMMENTS ON THE STATUS QUO REPORT AND VIEWS ON THE DESIRED STATE OF ENVIRONMENT

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9 December 2009	Kgubetswane Hall (Clarens)	14:00-16:00
10 December 2009	Mautse Town Hall (Rosendal)	10:00-12:00
11 December 2009	Fateng Hall (Paul Roux)	10:00-12:00

Queries related to these meetings can be directed to Miriam at CSIR on 012 841 3391 or Ms Mosima at Dihlabeng Local Municipality Offices on 058 303 5732."

Copies of the advertisements scanned from the three newspapers are displayed below:

CSIR
our future through science

...VIRONMENTAL MANAGEMENT
...HLABENG LOCAL MUNICIPALITY

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briewe van lesers

Municipal officials: On commission only!

With reference to your article on the dreadful circumstances regarding SA municipalities in the November edition, I would like to make the suggestion that municipal workers and management all be paid on a commission basis for work actually done. A large company works on this basis, from the tea-maker right up to the CEO. They get paid according to production activities performed during the course of a month. No production, no pay.

In many municipalities people are employed in high positions with high income that do not have the required training, experience, knowledge or abilities. And additional "management" positions are constantly created without providing the related productivity. Many municipalities today have good numbers of employees that are there purely to milk these municipalities dry and are absolute losses to both the municipalities as well as the rate payers. Employ them on the above basis and see how long they would survive. A proper system to control such activities would, however, need to be implemented and this is where the cookie would hit the fan! Most municipalities no longer have effective administration systems left any more either!

To many municipal employees their employers are there purely to pay them a monthly salary and to demand more. In other words, they are employed to be paid a salary – forget the word "WORK"! The question of productivity no longer exists and little is done by management to turn this around in any manner. Many of the municipalities have become political war zones.

Chris Breytenbach

Mantsopa: Disiatrous Services

Conratulations on your article "Municipal quagmire!" in the November 2009 edition.

I am the chairman of the Tweespruit Ratepayers Association.

Our Mantsopa Local Muncipality has not had the decency to respond to four registed letters - On at least three occasions the mayor and councillors have just not arrived for meetings they requested. Our sewerage system is disfunctional, a damming enviromental report in August 2005 was totally ignored and raw sewerage is polluting farm dams which eventually flow into the dam from which the town gets water.

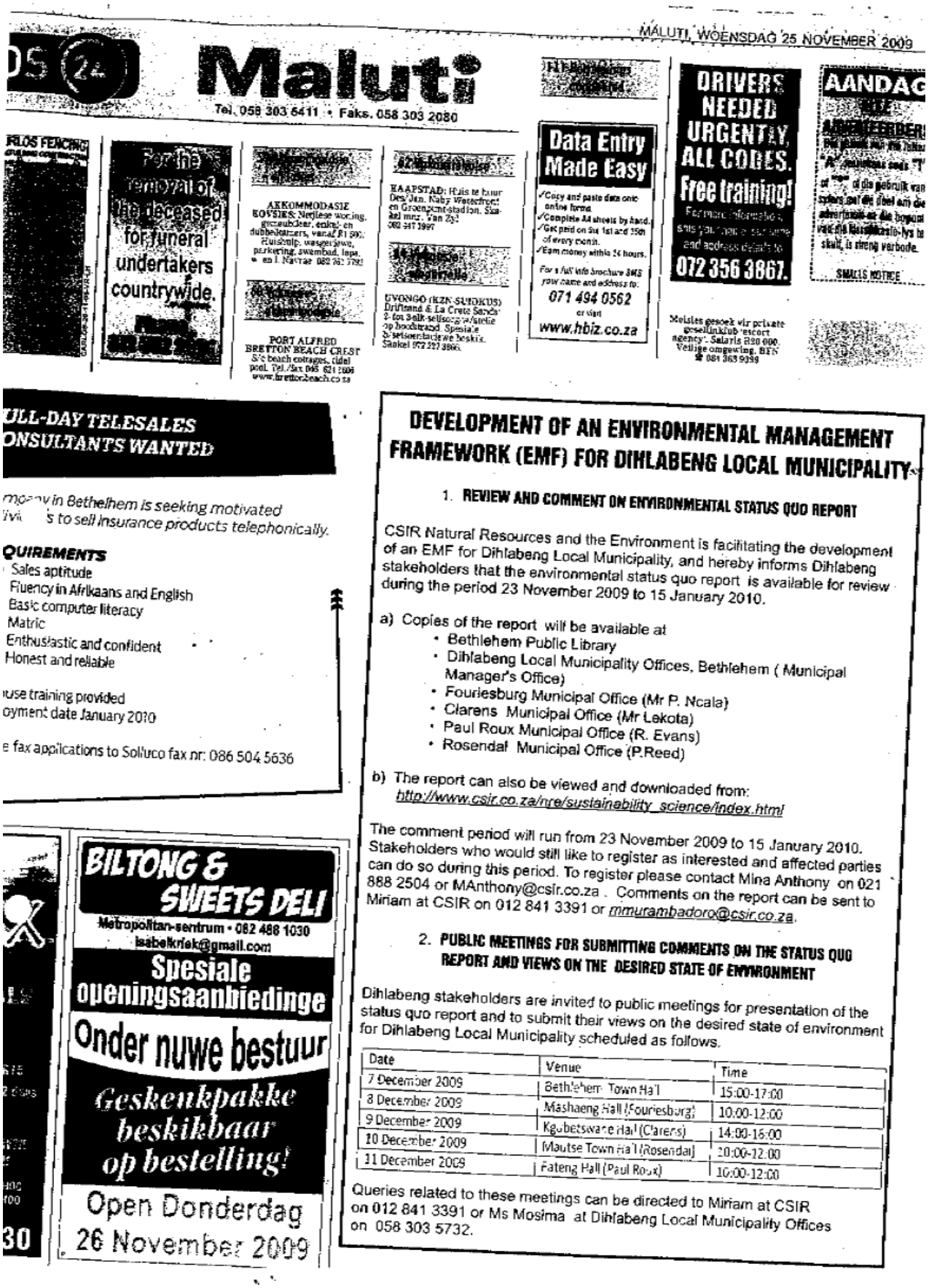
The Dept of Water Affairs and Forestry DWAF is investigating. It took numerous faxes and e/mails to NERSA.

Our muncipality does not have a valid licence for the electricity increases. We sent 43 emails to Pres Zuma's helpline who eventually ordered the Free State Dept of Local Government to meet with ratepayers and the Muncipality. The mayor, speaker, etc just did not arrive. Eventually a meeting was held, but are promises to improve things?

Harry Lane
Chairman: Tweespruit Ratepayers Association
082 438 8949

Need a website?
Giving you the edge!
WEB-D-ZIGN
& Associates
Enquiries 082 773 2150 or web@emarket.co.za

Figure AP 4.1: Advertisement which appeared in the Free State Business Bulletin, page 6 (December 2009/January 2010)



MALUTI, WOENSDAG 25 NOVEMBER 2009

Maluti

Tel. 058 303 6411 • Faks. 058 303 2080

Data Entry Made Easy

DRIVERS NEEDED URGENTLY, ALL CODES. Free training! 072 356 3867.

For the removal of the deceased for funeral undertakers countrywide.

AANDAG

ULL-DAY TELESALES ONSULTANTS WANTED

...mpany in Bethelhem is seeking motivated ...s to sell insurance products telephonically.

QUIREMENTS

- Sales aptitude
- Fluency in Afrikaans and English
- Basic computer literacy
- Matric
- Enthusiastic and confident
- Honest and reliable

...use training provided
...oyment date January 2010

...e fax applications to Solluco fax nr: 086 504 5636

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Queries related to these meetings can be directed to Miriam at CSIR on 012 841 3391 or Ms Mosima at Dihlabeng Local Municipality Offices on 058 303 5732.

BILTONG & SWEETS DELI

Metropolitan-sentrum • 082 488 1030

isabelkriek@gmail.com

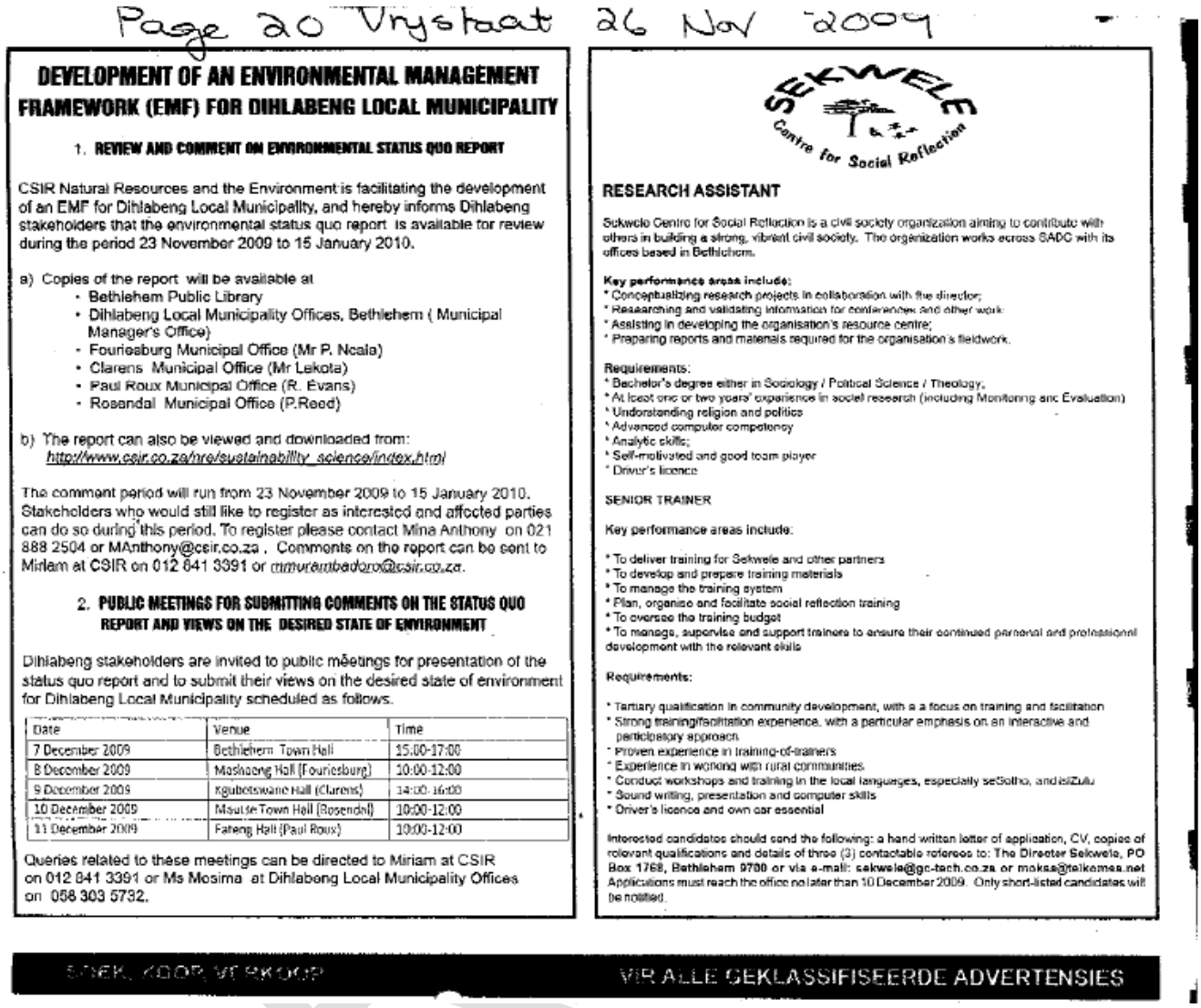
Spesiale openingsaanbiedinge

Onder nuwe bestuur

Geskenkpakke beskikbaar op bestelling!

Open Donderdag 26 November 2009

Figure AP 4.2: Advertisement which appeared in the Maluti, page 15 (25 November 2009)



Page 20 Vrystaat 26 Nov 2009

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SEKWELE Centre for Social Reflection

RESEARCH ASSISTANT

Sekwele Centre for Social Reflection is a civil society organization aiming to contribute with others in building a strong, vibrant civil society. The organization works across SADC with its offices based in Bethlehem.

Key performance areas include:
* Conceptualizing research projects in collaboration with the director;
* Researching and validating information for conferences and other work;
* Assisting in developing the organisation's resource centre;
* Preparing reports and materials required for the organisation's fieldwork.

Requirements:
* Bachelor's degree either in Sociology / Political Science / Theology;
* At least one or two years' experience in social research (including Monitoring and Evaluation)
* Understanding religion and politics
* Advanced computer competency
* Analytic skills;
* Self-motivated and good team player
* Driver's licence

SENIOR TRAINER

Key performance areas include:

* To deliver training for Sekwele and other partners
* To develop and prepare training materials
* To manage the training system
* Plan, organise and facilitate social reflection training
* To oversee the training budget
* To manage, supervise and support trainers to ensure their continued personal and professional development with the relevant skills

Requirements:

* Tertiary qualification in community development, with a a focus on training and facilitation
* Strong training/facilitation experience, with a particular emphasis on an interactive and participatory approach
* Proven experience in training-of-trainers
* Experience in working with rural communities
* Conduct workshops and training in the local languages, especially seSotho, and isiZulu
* Sound writing, presentation and computer skills
* Driver's licence and own car essential

Interested candidates should send the following: a hand written letter of application, CV, copies of relevant qualifications and details of three (3) contactable referees to: The Director Sekwele, PO Box 1768, Bethlehem 9700 or via e-mail: sekwele@gc-tech.co.za or makss@telkomsa.net Applications must reach the office no later than 10 December 2009. Only short-listed candidates will be notified.

VIR ALLE GEKLASSIFISEERDE ADVERTENSIES

Figure AP 4.3: Advertisement which appeared in the „Vrystaat" (26 November 2009)

The minutes of the public participation meetings held in each town are documented below:

1. Bethlehem

The meeting scheduled for 7 December 2009 at 15:00 at the Bethlehem town Hall did not take place as scheduled. No members of the public turned up for the meeting. The lack of turnout was explained by Ms Angela Mosima of DLM as being due to the fact that the loud hailer which the municipality uses to make announcements was not in working condition. The municipality had therefore not been able to announce the meeting in residential areas. Even though

advertisements had been placed in local newspapers that are given out free of charge, residents of Bethlehem had not responded to the advertisements. It was then agreed between the team developing the EMF and the representative of DLM that a meeting would be held at the same venue on 10 December 2009 at 1500. DLM undertook to make arrangements to access a loud hailer and to announce the meeting scheduled for 10 December. On 10 December the DLM informed the team developing the EMF that DLM had not been able to announce the meeting as local councillors were in Qwa Qwa attending to other business.

2. Fouriesberg

The meeting was held at Mashaeng Hall and was attended by 19 people as listed:

Venue: Mashaeng Hall, Fouriesberg **Date**: 08/12/2009

Name	**Address**	**Telephone/ Email**
1. Titoi Mofokeng	2235	073 698 5009
2. Mantsho		
3. Matseko	52	
4. Mapakiso	2401	
5. Letshele Manla	3081	
6. Thembi Leputla	1598	
7. Mampele Mofakeng	821	
8. Puseletso Martins	2444	078 829 9212
9. Mampolai Mapoto	Polasing	
10. Alina Moorosi	1558	076 537 2120
11. Seleso Mankotseng	1752 Mashaeng	
12. Margret Tseki	1340 Mashaeng	
13. Mamoratehi Tshabalala	1414 Mashaeng	
14. Letswalo Tshabalala	1414 Mashaeng	
15. Msimanga Alinah	1442 Mashaeng	
16. Motjhini Mokoena	3082 Mashaeng	
17. Sana Tshabalala	301 Mashaeng	
18. Mamosebetsi Radebe	70 Mashaeng	
19. Tefo Mofokeng	255	

Feedback on the status quo report:

The status quo report was accepted and no comments were made on it.

Feedback on desired state of the environment:

In the discussion leading to the broad vision for the further development of the municipality, it emerged that most of the people in Fouriesburg are employed on a seasonal basis at nearby farms. The main problem in the Fouriesburg community is unemployment. The articulated broad vision for the development of the municipality includes:

- The municipality should develop in a way that creates employment opportunities for residents;
- Basic infrastructure and services – development of the municipality has to cater for provision of infrastructure and services – services in the area are inadequate, for example people have to travel to Bethlehem to access basic groceries.
- Conservation of natural open space: open spaces in the town, and the township in particular should be conserved. The community does not have a park and would want some of the open space to be conserved through the creation of a park and its related infrastructure.
- Conservation of natural open space: open spaces not converted to a park should be conserved through maintenance of the natural grassland. Some of the open space could be utilised for growing medicinal plants which could be replanted if necessary
- Agricultural zone: this zone should be demarcated to include areas designated for small scale farming. The people of Fouriesburg want to engage in crop cultivation and would want some of the surrounding farm land to be delineated for small scale agriculture and to be made available to them. The availability of land for small scale farming should be accompanied by proper support to ensure that production is maintained and environmental degradation minimised.
- Agricultural zone: the agricultural zone should be demarcated to include areas which can be used for communal livestock grazing. This would address the problem of people keeping cattle in the township.
- Targets to water management: consistent supplies of high quality water should be provided to residents. Currently there are concerns about irregular water supply and poor quality (based on visual assessment of residents).

3. Clarens

The meeting in Clarens was held at Kgubetswane hall and was attended by 37 people as listed:

Venue: Kgubetswane Hall**,** Clarens **Date:** 09/12/2009

Name	**Address**	**Telephone/Email**
1. Nnina Mofokeng	569 Kanana	073 874 9254
2. Ntombi Mkhize	802 Phahameng	076 727 3924
3. Tropie Mokoena	Mokobobong	072 110 9828

4. Pauline Nosi	62 Khubetswana	
5. Majimi Mokoena	1020 Mokobobong	
6. Tsepiso Mosia	246 Kgubetswana	083 731 7536
7. Nkata Mabili	558 Kanana Clarens 9707	073 443 6288
8. Lefu Molaba	52 Kgubetswana	078 713 1299
9. Johannes Nhlapo	76 Kgubetswana	079 656 1795
10. Taelo Mokoena	2005 Mokobobong	076 431 2213
11. Lepati Macaphasa	530 Kanana	078 661 6196
12. Mohlophei Motlokoa	459 Kgubetswana	
13. Mamatala Mashinidi	497 Kanana	072 985 0430
14. Mapula Mahlatsi	562 Kanana	073 644 4060
15. Kaothaso Malakoane	589 Kanana	
16. Mmapaseka Mokoena	740 Kanana	083 943 2622
17. Mapusetso Dlamini	424 Kgubetswana	076 276 5613
18. Mahibuseng Mosiea	284 Kgubetswana	073 367 6126
19. Clr Ma Mashinini	286 Kgubetswana	076 834 1531
20. Tom Mlangeni	Pahameng 1010	
21. Tshahle Tshabalala	1022 Phahameng	072 407 2645
22. Matshediso Maroko	785Phahameng	076 177 0661
23. Paulos Nhlapo	Mokobobo	079 387 2628
24. Sana Nhlapo	Mokobobo	079 387 2628
25. Sesi Makhoa	38 Kgubetswana	
26. Tshwanyane Mbele	344 Kgubetswana	079 250 7594
27. Mashinini Mamoqebelo	495Kanana	082 817 4788
28. Maditsie Legoabala	619 Kanana	073 699 5836
29. Mamavoso Mashinini	713 Kanana	073 251 2027
30. Sibina Tshehisi	30 Kgubetswana	073 217 2904
31. Matsie Motaung	793 Phahameng	078 595 1250
32. Dikeledi Lebudi	104 Kgubetswana	
33. Elizabeth Moko	35 Kgubetswana	
34. Mpho Thamae	352 Kgubetswana	
35. Nomasonto Miye	96 Kgubetswana	
36. Maduna Nnana	352 Kgubetswana	
37. K P Mashinini	881 Phahameng Chiniza	072 269 4642

Feedback on the status quo report:

The status quo report was accepted with no comments.

Feedback on desired state of the environment:

Broad vision for development of the municipality: Opportunities presented by tourism in the area should be made accessible to all people in the town including those in the township. This includes the need for residents of Kgubetswane to access land in order to build a bed and breakfast in the township and benefit from tourism. Infrastructure should be improved e.g. the sewerage system needs to be improved and a stadium is required in Clarens.

- Conservation of cultural and historical elements: a cultural village should be set up from which locals can showcase their culture and sell their crafts;
- Agricultural zone: There should be areas demarcated for small scale agriculture (livestock, cash crops and grains) within the agricultural zone;
- Conservation of cultural and historical elements: Cultural and historical elements should continue to be conserved. Public access to historical sites that are presently on private farms should be ensured.
- River health: rehabilitation of rivers should take place to control alien vegetation and pollution;
- Energy use: Provision should be made to increase use of electricity in homes in order to reduce the use of firewood and the attendant deforestation. Currently use of firewood is high in Kgubetswane.

4. Rosendal

The meeting in Rosendal was held in Mautse Hall on 10 December 2009 and was attended by 36 people as listed:

Name	Address	Telephone/email
1. Maneo Monqila	639 Mautse Rosendal	
2. Sekete Nomasondo	1108 Mautse Rosendal	
3. Khumalo N.S	493 Mautse Rosendal	078 429 7998
4. Elizabeth Mosoeu	439 Mautse Rosendal	
5. Thapelo Malaka	54 Mautse Rosendal	071 315 9337
6. Makhauta Radebe	428 Mautse Rosendal	076 845 4386
7. Slotheng Morena	275 Mautse Rosendal	073 620 6489
8. Manyepiti Nyepetsi	Deunie	
9. Morena Tshabalala	1167 Mautse Rosendal	
10. Sabata Jann	1097 Mautse Rosendal	
11. Motshoneng Lehlokola	Metetati	
12. Mastive Litaba	Metetati	

13. Mohaeka Lieketseng	577 Mautse Rosendal	073 255 0254
14. P. A. Maema	696 Mautse Rosendal	
15. Mokoaba Malefu	1219 Mautse Rosendal	082 077 5427
16. Dibuseng Maphepa	985 Mautse Rosendal	
17. Mosia Diekesteng	1037 Mautse Rosendal	078 272 8688
18. Moalusi Mapulane	463 Mautse Rosendal	073 467 8025
19. Maneo Moejane	722 Mautse Rosendal	
20. Maphashane Sepheko		
21. Tshepo Makau		
22. Matshiwane Thoabala	467 Mautse Rosendal	058 211 0632
23. Sebongile Lidaba		
24. Malefetsane Khiba	557 Mautse Rosendal	078 376 7906
25. Abel Motijane	169 Mautse Rosendal	073 668 3138
26. N. Routsoti	169 Mautse Rosendal	073 668 3138
27. Mauthadi Komako	407 Mautse Rosendal	078 014 0610
28. Makhaka Tshabalala	672 Mautse Rosendal	083 324 2715
29. Thahane P.	643 Mautse Rosendal	078 913 9450
30. Lehlakeng M.	528 Mautse Rosendal	083 315 8865
31. Kabelo Molantoa	435 Mautse Rosendal	071 475 8996
32. Lehola Malefetsane	423 Mautse Rosendal	
33. Nkokoi Mzizi	680 Mautse Rosendal	
34. Molelekeng Mothupi	1041 Mautse Rosendal	073 737 5975
35. Mahlopeng Mohala	1322 Mautse Rosendal	
36. Moleboheng Mankoe		073 341 5215

Feedback on the status quo report:

The report was accepted with no comments.

Feedback on desired state of the environment:

- Broad vision for development of the municipality: There is need to improve infrastructure and sanitation in the municipality such as supply of water, electricity, toilets, roads and recreation facilities. Services such as shopping facilities are needed as people currently travel to Senekal to access shopping facilities.
- Targets for water management : Water provided for consumption should be clean.
- River health: Rivers and dams should be cleared of silt and dirt – this is affecting the quality of the water.

- Agricultural zone: The agricultural zone should be demarcated to include areas for small scale farming. Land should be made available in the zone demarcated for small scale farming to residents of Rosendal who would like to farm.

5. Paul Roux

The meeting in Paul Roux was held in Fateng Hall and was attended by 60 people as listed:

Venue: Fateng Hall, Paul Roux **Date**: 11/12/2009

Name	Address	Telephone/Email
1. Nthoesele	1428	
2. Nthona	1428	
3. Mosia Dimakatso	1493	084 673 2782
4. Mkwani Lettie	1493	
5. Tshedi Mokoakoe	1428	071 332 6949
6. M Motaung	1262	071 031 2033
7. Masena PJ	1568	071 518 4524
8. Masena N	1568	
9. Pai Mongodi Isak	Makwetu 684	
10. Mosea Lefu Secrit	Makwetu 652	
11. Ncube Shadrack	1568	
12. Byl Motlokoa	Makwetu 762	
13. Maria Moloi	804	
14. Matebelo Motaung	964	
15. Makwena Hanong	962	
16. Mathabo Mcdo	755	
17. Maki Tjhitjha	1063	
18. Mohlomi Polo	799 Fateng tse Ntsho	084 362 8118
19. Dlamini Puleng	143 Fateng tse Ntsho	079 106 4329
20. Tshokolo Radebe	761 Fateng tse Ntsho	082 046 8999
21. Mahase Dieketseng	646 Fateng tse Ntsho	
22. Radebe Disebo	486 Fateng tse Ntsho	084 454 4652
23. P Mhlambe	514 Maseko section	
24. Mkwanazi Themba	1505 One Price section	
25. Miheola	765 Fateng tse Ntsho	
26. Porsia Mokoena	682	074 569 4491
27. Mantshiuwa Mantsoe	681	071 500 5108
28. Aim Sehlolo	688	073 021 2361
29. Dorah Moloi	191 old location	083 738 9428
30. Dineo Mphutli	94 old location	072 133 5156

31. Mokone Motaung	573	078 321 2150
32. Keiti Mbokaz	547	
33. Mamosebetsi Maseko	552	
34. M.L Radebe	516 Makwetu	073 955 4762
35. Alice Mzizi	676 Makwetu	
36. Mahlobo Sibongile	1190T.K loc	
37. Thapelo Nchamo	780 Makwetu	
38. Lebenya Motaung	560 Maseko section	076 673 4534
39. Mofaung Motheosane	469 Fateng tse Ntsho	072 359 6000
40. Sarah Lehloenya	145 Fateng tse Ntsho	082 056 3426
41. Mafani Tsotetsi	141 Fateng tse Ntsho	
42. Daniel Kheola	809	084 891 2471
43. James Makwanya	1478	
44. Mofokeng Steve	810 Makwetu	
45. Tsuinyama Moakho	1360	
46. Nzimande Mafetsane	524	
47. Motaung M.P.	472	
48. Steven Chibane	545	
49. Mzizi Mahlolo		
50. Sondo	620	
51. Mmatshele Tseki	573	082 218 8067
52. Thakane Lekgala	439	
53. Mosia Mmadintja	1447 one price	071 317 3782
54. Mokoena Mahakala	1448 one price	
1. Tsuinyana Disebo	114 Fateng tse Ntsho	078 846 7848
55. Eva Ngwenya	181 Fateng tse Ntsho	078 201 5915
56. Meisi Motaung	1064 Fateng tse Ntsho	
57. Moloi Mamthala	771 Makwetu Fateng tse Ntsho	
58. Moloi Makawe E	894 Ithoballe Fateng tse Ntsho	078 788 7674
59. Mbazini Mphumelelo P	1317 Takalatsa Fateng tse Ntsho	073 165 9807

Feedback on the status quo report:

The report was accepted and no comments were made on it.

Feedback on desired state of the environment:

Broad vision for development of the municipality: Development in the municipality should address infrastructure and services, for example, water, electricity and sanitation. Provision of water, sanitation and electricity should be maintained in order to support the development of job creating enterprises. Development should also address unemployment and equip people with

the skills and financial resources to start small businesses targeted at the tourist market e.g. accommodation and restaurant facilities.

- Urban zone: More land should be made available for housing in the urban zone as there is currently not enough land for housing
- Ecological/conservation zone: Land should be retained for conservation
- Conservation of natural open space: Open spaces should be maintained. Spaces outside the township can be used for farming while some open spaces in the township should be used for housing and parks.
- Conservation of cultural and historical elements: There is need for facilities to promote art and culture – for example, there is need for a craft centre for people to sell their crafts and provide entertainment through groups who perform traditional songs and dance.

APPENDIX 5:

Meeting with officials of the Dihlabeng Local Municipality, Free State Department of Economic Development, Tourism and Environmental Affairs and National Department of Environmental Affairs.

In addition to the public participation meetings, a meeting was held on 9 December 2009 with officials of Dihlabeng Local Municipality, Free State Department of Economic Development, Tourism and Environmental Affairs, CSIR and the National Department of Environmental Affairs. The purpose of the meeting was to present and discuss the status quo report and to discuss the desired state of environment determined. The meeting was held at the Dihlabeng local municipality offices in Bethlehem and was attended by 12 people as listed below:

Name	Institution	Contact details
1. S. Zwane	Department of Environmental Affairs	012 310 3146 szwane@deat.gov.za
2. S. Hlela	Department of Environmental Affairs	0123103045 shlela@deat.gov.za
3. Mofokeng Lefu	Department of Environmental Affairs	lmofokeng@deat.gov.za
4. Mofokeng Miranda	Dihlabeng Local Municipality (IDP officer)	0583035732
5. Grace Mkhosana	Department of Economic Development, Tourism and Environmental Affairs (Free State Province)	mkhosana@detea.fs.gov.za
6. L. W. Moshwaliba	Dihlabeng Local Municipality (Agricultural development officer)	lmoshwaliba@dihlabeng.co.za

7. C. Musvoto	CSIR – Natural Resources and the Environment	cmusvoto@csir.co.za
8. M. J. Potsane	Dihlabeng Local Municipality (IDP Manager)	0583035732
9. Modisaotsile C.J	Dihlabeng Local Municipality (water)	0583035732
10. D.C. Kunene	CSIR – Natural Resources and the Environment	kkunene@csir.co.za
11. M.D. Murambadoro	CSIR – Natural Resources and the Environment	mmurambadoro@csir.co.za
12. M.A.B. Mosima	Dihlabeng Local Municipality (Solid waste management)	0836832348 0583035732

Feedback on the status quo report

- The number of wards is 19 and not 17 as recorded in the report;
- Consultation can be done using different methods and the more effective one is working with the people on the ground (communities);
- The climate has changed over the past 2-3years and it might be best to get the most recent statistics from the local weather station (can arrange meeting);
- Hydrology- try to source recent information on river health and quality of water from DWAF;
- Concerns were expressed over the mention of „sewage" in the report –the official who raised the concern had the impression that the report was indicating that sewage was being disposed of into the DLM Rivers and requested evidence of the exact points where this was happening. The CSIR project team pointed out that the report did not allege any disposal of sewage into river systems by DLM, but pointed out that neighbouring municipalities had this problem and DLM could be affected;
- Environmental concerns- there is a conservancy group in Clarens that could provide more information on the state of the environment and the activities they engage in to conserve the environment;
- Heritage sites: - it was pointed out that there could be more heritage sites than listed in the report, but no specifics were given. the DLM Agricultural Development Officer offered to provide information on more sites later;
- There was a request to indicate the data source and dates for each map;
- Sensitivity analysis maps should show recent information;
- There is need indicate the method that was used to determine the sensitive areas and what informed the endangered species;

- SDF &IDP reports should inform the status quo report. Some areas are already developed but they are shown on maps as sensitive. A layered map which shows both sensitive areas and developed areas is required;
- There is need to check if the maps produced link with what is in the latest SDF. The latest data sets should be used to create the maps and there is need for some ground truthing to verify some of the information;
- The Free State Department of Agriculture has some information that can be used for the sensitivity map. There is a project FS 5 river project that is looking at the state of rivers it is funded by DEAT. More information can be obtained from the River Rangers Implementation Officer Gath on 082 459 9621;
- Areas with environmental growth problems such as poor sanitation should be highlighted;
- The status quo report should indicate the type of vegetation in the different areas as this has implications for agriculture - some of the grass like the sour veld is not palatable for cattle;
- *Page 40* refuse removal: the status of the dumping sites i.e. whether they are licensed or not should be indicated;
- There is need to compare the sensitivity map done by SANBI with the one in the status quo report and also compare the source of data and the year. All maps should be properly referenced;
- Page 44: Health - the report states that there are two hospitals – it does not include private hospitals – these should also be considered as people make use of them;
- Make use of layers of information we have and find the opportunities there for example tourism, soils for farming. This information will also be used for EIA applicants and assist in making the IDP.

Desired state of the environment

<u>Opportunities</u>

- Make use of available layers of information e.g. conservation areas to identify the opportunities there, for example tourism, soils for farming. This information will also be used for EIA applications and assist in updating the IDP;
- Opportunities and constraints should come from the status quo. The desired and undesired state of the environment activities are determined by the status quo;
- GIS can be used to create a hyperlink to show management zones and show the desired activities;

- Information on soil depth and horizons could be included – necessary to understand that site specific information is not necessarily relevant in an EMF which is a strategic tool – such information can be included in appendices if deemed necessary.

Constraints

- Air quality is not a major constraint but could be seen as an opportunity which can be added in the recommendations;,
- Littering: some constraints can be dealt with under recommendations.

Development pressures and proposed management zones

- It was suggested that the ecological and conservation zones should be clustered together so that the ecological zones create opportunities for conservation. Different shades of green could be used to distinguish between ecological areas and conservation areas but it should be under one management zone;
- Mining could be added as another management zone - even though currently there is very little mining, this sector has potential to grow in DLM. There are some companies that have applied for licenses to mine in DLM. Geosciences could be consulted for the list of minerals in the DLM. What is being mined and those minerals yet to be mined should be checked so that this management zone is created proactively;
- Urban management zone: there should be a sub category that would help exclude some activities from the urban areas even during EIA applications;
- The urban zone should also consider housing and infrastructure development and this should be linked to what the SDF has earmarked for housing;
- There is development of recreation facilities outside the formal conservation areas. The guidelines on tourism should incorporate what the municipality is doing to deal with tourism. Tourism should be a distinct management zone.

The following management zones were agreed to:

- Ecological (to include conservation);
- Agricultural;
- Urban;
- Mining;
- Tourism (overlaps with ecological zone).

APPENDIX 6: METADATA REPORT

Feature	Source	Figure
Dihlabeng Local Municipality	Municipal Demarcation Board, 2005	All
Roads, Towns	Chief Directorate Surveys and Mapping – 2006 (vector)	All
Airport and Railway Stations	Digitised from 1:50 000 Raster Topo sheets (2005)	1.1, 2.20
Waterbodies (Dams, Large Resevoirs, Marsh vleis, Non-perennial pan, Perennial pan)	Chief Directorate Surveys and Mapping – 2006 (vector)	1.1, 2.9
Rivers	Chief Directorate Surveys and Mapping – 2006 (vector)	All
Mean annual Temperature	Schulze, R.E. (Ed). 2007. South African Atlas of Climatology and Agrohydrology. Water Research Commission, Pretoria, RSA, WRC Report 1489/1/06	2.1
Mean annual precipitation	Schulze, R.E. (Ed). 2007. South African Atlas of Climatology and Agrohydrology. Water Research Commission, Pretoria, RSA, WRC Report 1489/1/06	2.2
Hillshade background	Consultative Group on International Agriculture Research (CGIAR), Shuttle Radar Topography Mission (SRTM) 90m resolution. Image taken 1999	2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.13, 2.15, 2.22
National Landcover 2000	Van den Berg, E.C., Plarre, C., van den Berg, H.M. and Thompson, M.W. 2008. The South African National Land Cover 2000. Agricultural Research Council (ARC) and Council for Scientific and Industrial Research (CSIR), Pretoria. Report No. GW/A/2008/86.	2.3
Elevation	CSIR 2009 – Digital Elevation Model (DEM) derived using the Topo to Raster tool in ArcGIS (using CDSM spot height, 5m contour data and 1:50 000 rivers). 20m by 20m resolution.	2.5
Slope	CSIR 2009. Derived from CSIR 2009 DEM	2.6
Ridges	Calculated from Slope (DEM - CSIR 2009)	2.7

Geology	Council for Geosciences. 1994. Geological map of South Africa, 1:1 000 000 scale. Council for Geosciences, Pretoria, South Africa.	2.8
Quaternary Catchments	Department of Water Affairs. Downloaded from www.dwaf.gov.za	2.9
Vegetation Biome	Mucina, L. and Rutherford, M.C. (eds.) 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19, South African National Biodiversity Institute, Pretoria. 807 pp.	2.10
Vegetation Type	Mucina, L. and Rutherford, M.C. (eds.) 2006. The Vegetation of South Africa, Lesotho and Swaziland. Strelitzia 19, South African National Biodiversity Institute, Pretoria. 807 pp.	2.11
Floral Conservation Status	Description of conservation status from Biodiversity Assessment. From Mucina and Rutherford (2006).	2.12
Sensitive Areas	Ridges – From Figure 2.7 Endangered Vegetation – From Figure 2.12 Buffered Rivers – CDSM 2006 Buffered Wetlands – National Wetland Map 3 - SANBI	2.13
Conservation Areas	SANBI. From SANPARKS Formally Protected Areas - 2001	2.14
Land Capability per Mesozone	GAP (Geospatial Analysis Platform) version 1. CSIR 2004 obtained from AGIS (Agricultural GIS)	2.15
Crop Types	National Crop Statistics Consortium 2007	2.16
Field Crop Boundary	National Crop Statistics Consortium 2008	2.17
Mining Activities	NLC2000 (Figure 2.3) Dwelling Inventory – Obtained from Eskom (April 2009)	2.18
Dwelling Types	Dwelling Inventory – Obtained from Eskom (April 2009)	2.19
Transport Infrastructure	Roads and Railways - Chief Directorate Surveys and Mapping – 2006 (vector) Airports, Landing Strips and Railway Stations - Digitised from 1:50 000 Raster Topo sheets (2005)	2.20
Population Density	GAP (Geospatial Analysis Platform) version 1. CSIR	2.22
Education Facilities	Municipal Demarcation Board (2002) Dwelling Inventory – Eskom (obtained 2009) CDSM 2006	2.23
Medical Facilities	Municipal Demarcation Board (2002)	2.24

Environmental Control Zones	CSIR 2010	6.1
Sensitivity Classes	CSIR 2010	7.1