# FINAL RESOURCE MANAGEMENT PLAN

# MTHATHA DAM




water & sanitation

Department:
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- Eastern Cape Department of Economic Development, Environmental Affairs and Tourism;
- Department of Agriculture, Forestry and Fisheries; and
- King Sabata Dalindyebo Local Municipality.

# Title and Approval Page

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**Review:**

| Review Period | Month | Year | | | | |
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| Five (5) Yearly review of RMP | August | 2019 | | | | |

# Amendments Page

| Date | Nature of Amendment | Amendment No. |
|---|---|---|
| 29 September 2014 | First Draft for DWS Review | 1 |
| 10 October 2014 | Draft for PSC Review | 2 |
| 31 October 2014 | Draft for Public Review | 3 |
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# Executive Summary

According to the Guidelines for the Compilation of Resource Management Plans (2006), the main aim of a Resource Management Plan is to "attain the objectives underlying sustainability and to compile workable, functional sustainable access and utilisation plans for water resources and in particular State Dams". A Resource Management Plan is thus a planning tool aimed at working within the requirements of existing policies, while taking into account the needs and interests of stakeholders.

A Resource Management Plan can also be described as a systematic process for the sustainable development and management of a water resource in the context of social, economic and environmental objectives. One of the main functions of the Resource Management Plan process is to implement an **Institutional Plan**. The focus on institutional arrangements is accompanied by a **Zonal Plan** together with a detailed **Strategic Plan**. In addition, a **Financial Plan** provides guidance on funding opportunities and how these should be used for the improved management of the Dam. Together these components provide a comprehensive guide on the "what?"; "why?"; "how?" and "who?" of the management of prioritised Government Waterworks.

Mthatha Dam was built in 1977 and is an earthfill embankment Dam with a full supply capacity of 254 million m³. The Dam is built on the Mthatha River approximately 6 km north-west of Mthatha town (River Health Programme, 2008).

Its main functions are to supply water to the city of Mthatha and associated peri-urban areas, and to regulate the flow of the Mthatha River for power generation at the two hydro-electric plants situated further downstream at First and Second Falls.

The Dam is used informally for recreation by the adjacent communities and the most common activities include:

- Swimming;
- Picnicking; and
- Subsistence Fishing.

The Dam is also used for a number of traditional ceremonies by the adjacent community. Moreover, there are no fences around the Dam and thus the Dam is an important source of water for cattle. Although most of the adjacent community has access to piped water, there are often shortages and issues with supply. The Dam therefore often provides water for domestic purposes including drinking and washing of clothes.

Occasionally the Dam is also used by tourists who are in the area and local websites note that fishing from boats, skiing and canoeing are popular activities. However, formally, the Dam is not open for recreation. There are also no recreational clubs based at the Dam.

The Dam is also located next to Luchaba Nature Reserve which is home to a variety of wildlife and a series of wetlands and grasslands that support a wide selection of birds including the rare Stanley's bustard. The Department of Environmental Affairs in partnership with the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism, Eastern Cape Parks and Tourism Agency and King Sabata Dalindyebo Local Municipality have developed a conference facility, restaurant and sunset bar in Luchaba Nature Reserve on the banks of Mthatha Dam.

In compiling the Resource Management Plan for Mthatha Dam the following process was applied.

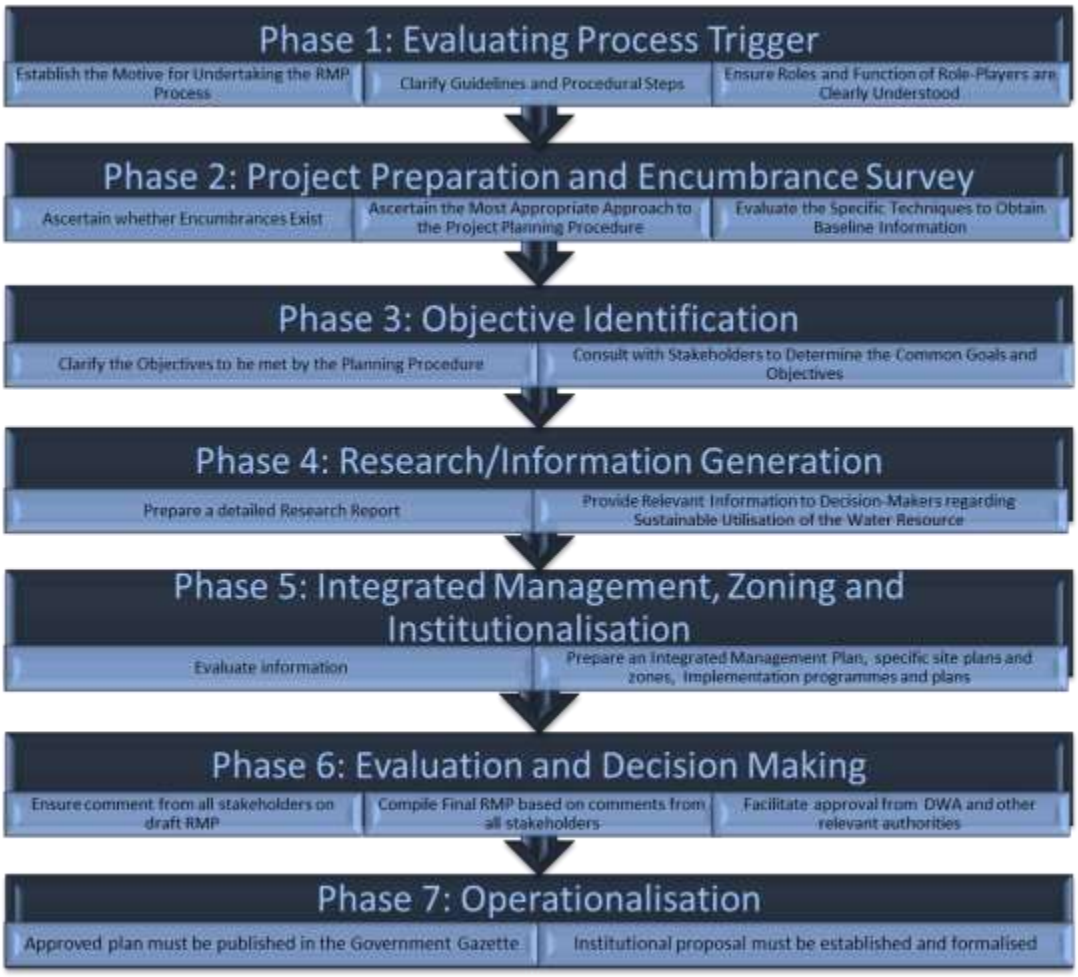


*Figure 1: RMP Process (DWA, 2006)*

It is important to note that the Resource Management Plan was compiled based on detailed stakeholder input and engagement. This formed the cornerstone of the Resource Management Plan through the establishment of a Vision for the Dam with a number of Key Objectives.

The key recommendations of the Mthatha Dam Resource Management Plan are as follows:

- Implementation of the Institutional Plan including the formation of a Dam Management Committee, Operations Management Committee and Resource Management Plan Steering Committee. As part of this Institutional Plan, it is vital that all agreements are updated to take into account the findings of the Resource Management Plan;
- Implementation of standardised and harmonised Aids to Navigation and Demarcation Markers and Unique Positioning Number System and the Wash Bay System at the Dam;
- Facilities at the Public areas to be created;
- Assessment of spillway buffer to be undertaken to determine what buffer is required. The assessment should also assess what activities can take place at the Dam without compromising the spillway;
- Survey of the Shoreline boundary and determination of the full supply line and buffer and Land matters to be resolved including discussions with the surrounding communities and compensation for land where necessary;
- Legalise agricultural development around the Dam;

- Flood warning system to be developed to ensure downstream communities are warned of floods;
- Coordination with SwimSA to create a swimming school at the Dam;
- Discussions with South African Sports Confederation and Olympic Committee and other national associations regarding the potential for the Dam to be used as a venue for national and or provincial competitions;
- Integrated tourism plan to be developed;
- The potential for community agriculture programmes with irrigation to be determined. These community programmes could provide food for tourism ventures in the area;
- Potential for water troughs for watering of cattle;
- The potential for a small-scale fisheries project for the local community to be determined;
- Partnership with the Department of Environmental Affairs, Eastern Cape Department of Economic Development, Environmental Affairs and Tourism , Eastern Cape Parks and Tourism Agency, and King Sabata Dalindyebo Local Municipality in order to enable improved tourism at the;
- Potential feasibility of a Butterfly Park to be assessed;
- The feasibility of linkages with Mthatha Airport and the use of the Dam by water planes;
- Development of community craft market linked to cultural village at the Dam;
- Development of micro-enterprises and entrepreneurs;
- Discussions with the National Land Care programme to ensure eroded areas around the Dam are rehabilitated;
- Biodiversity studies including, flora, fauna, avifauna, fish etc. to understand the natural resources around the Dam and in the nature reserve. The information from these studies can be used to ensure sustainable development and for marketing of the Dam;
- LNR to be proclaimed as a provincial nature reserve;
- Survey of the Dam to identify any Invasive Aquatic Plants;
- Pollution point study to be undertaken to identify main sources of pollution at the Dam;
- Upgrade of the Elangeni Wastewater Treatment Works;
- Shoreline management plan to be compiled and implemented;
- Education programmes regarding the impacts of alien invasive species to be instituted;
- Paleontological and archaeological heritage resources study to be undertaken;
- Population assessment of Stanley Bustard; and
- Sustainable fishing plan for invasive species to be compiled;
- The potential feasibility for a ferry system;
- The potential feasibility for the relocation of the bridge to be determined; and
- The upgrade of the Rosedale Water Purification Plant to improve water supply to communities;
- Lifeguard skills training and first aid training to ensure safe public use of the Dam;
- An Education programme to be developed by the Department of Health regarding safe use of raw water for domestic purposes wareness campaign to be developed by the DMC. The campaign should focus on potential uses of the Dam, the importance of infrastructure (to ensure no vandalism), Dam safety and the Dangers of swimming across the Dam; and
- Discussions between local schools and universities regarding the potential for using the Dam as part of education programmes.

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# Acronyms

| | |
|---|---|
| **ADU** | Avian Demographic Unit |
| **AGIS** | Agriculture Geo-Reference Information System |
| **AtoN** | Aids to Navigation |
| **BMAA** | β-N-methylamino-L-alanine |
| **BP** | Business Plan |
| **CARA** | Conservation of Agricultural Resources Act (Act 43 of 1983) |
| **Cd** | Cadmium |
| **CITES** | Convention on the International Trade in Endangered Species |
| **CIWSP** | Cooperative Inland Waterways Safety Programme |
| **COGTA** | Department of Cooperative Governance and Traditional Affairs |
| **CPSI** | Centre for Public Service Innovation |
| **CPSI** | Centre for Public Service Innovation |
| **DAFF** | Department of Agriculture Forestry and Fisheries |
| **DEA** | Department of Environmental Affairs |
| **DMC** | Dam Management Committee |
| **DoT** | Department of Transport |
| **DPW** | Department of Public Works |
| **DRDLA** | Department of Rural Development and Land Reform |
| **DWA** | Department of Water Affairs |
| **DWAF** | Department of Water Affairs and Forestry |
| **DWS** | Department of Water and Sanitation |
| **ECC** | Effective Carrying Capacity |
| **EC-DEDEAT** | Eastern Cape Department of Economic Development, Environmental Affairs and Tourism |
| **ECPTA** | Eastern Cape Parks and Tourism Authority |
| **EIA** | Environmental Impact Assessment |
| **GDP** | Gross Domestic Product |
| **GGP** | Gross Geographic Product |
| **GIS** | Geographic Information System |
| **GN** | Government Notice |
| **GVA** | Gross Value Added |
| **Ha** | Hectare |
| **I&APs** | Interested and Affected Parties |
| **IA** | Implementing Agent |
| **IALA** | International Association of Marine Aids to Navigation and Lighthouse Authorities |
| **IDP** | Integrated Development Plan |

| | |
|---|---|
| **IDZ** | Industrial Development Zone |
| **ISP** | Internal Strategic Plan |
| **IWRM** | Integrated Water Resource Management |
| **KSDLM** | King Sabata Dalindyebo Local Municipality |
| **LAAP** | Local Accountable AtoN Parties |
| **LNR** | Luchaba Nature Reserve |
| **MA** | Million Years Ago |
| **MAR** | Mean Annual Rainfall |
| **MW** | Mega Watts |
| **NEMA** | The National Environmental Management Act (Act 107 of 1998) |
| **NEMBA** | National Environmental Management: Biodiversity Act (Act 10 of 2004) |
| **NEMPA** | National Environmental Management: Protected Areas Amendment (Act 15 of 2009) |
| **Ni-Cd** | Nickel-Cadmium |
| **NTU** | Nephelometric Turbidity Units |
| **NWRI: IEE** | National Water Resources Infrastructure: Integrated Environmental Engineering |
| **OMC** | Operations Management Committee |
| **ORTDM** | OR Tambo District Municipality |
| **P** | Phosphorous |
| **PCC** | Physical Carrying Capacity |
| **PFMA** | Public Finance Management Act |
| **PGDP** | Provincial and Growth Development Plan |
| **PPP** | Public Private Partnership |
| **QDS** | Quarter Degree Square |
| **RCC** | Real Carrying Capacity |
| **RHIB** | Rigid Hulled Inflatable Boat |
| **RMP** | Resource Management Plan |
| **RSC** | RMP Steering Committee |
| **RWU** | Recreational Water Use |
| **SAHRA** | South African Heritage Resources Agency |
| **SAHRIS** | South African Heritage Resources Information System |
| **SAMSA** | South African Maritime Safety Authority |
| **SANBI** | South African National Biodiversity Institute |
| **SAPS** | South African Police Service |
| **SARCA** | South African Reptile Conservation Assessment |
| **SASCOC** | South African Sports Confederation and Olympic Committee |
| **SoER** | State of the Environment Report |
| **SPC** | Strategic Plan for Commercialisation |
| **SPC** | Strategic Plan for Commercialisation |
| **SRSA** | Department of Sports and Recreation |

| | |
|---|---|
| **TAL** | Total Alkalinity |
| **TDS** | Total Dissolved Salts |
| **THETA** | Tourism, Hospitality and Sports Education Training Authority |
| **ToR** | Terms of Reference |
| **UPN** | Unique Positioning Number (used in the CIWSP) |
| **WHO** | World Health Organisation |
| **WIP** | Weeds and Invasive Plants |
| **WMA** | Water Management Area |
| **WWTWs** | Waste water Treatment Works |
| **ZSSA** | Zoological Society of South Africa |

# 1 WHAT IS A RMP AND WHY IS IT NECESSARY?

A Resource Management Plan (RMP) is a management tool which provides guidance on how recreational use at Government Waterworks, such as Dams, should be managed. RMPs focus on the current and future uses of the Dam, as well as requirements that must be met, to ensure the optimal, equitable and sustainable management of the Dam.

According to the Guidelines for the Compilation of RMPs (DWAF, 2006), the main aim of the RMP is to "attain the objectives underlying sustainability and to compile workable, functional sustainable access and utilisation plans for water resources and in particular State Dams". A RMP is thus, a planning tool aimed at working within the requirements of existing Government Policy, while taking into account the needs and interests of stakeholders.

A RMP can also be explained as a systematic process for the sustainable development and management of a water resource in the context of social, economic and environmental objectives. In many ways, it shares similarities with Integrated Water Resource Management (IWRM). Hence, one of the main functions of the RMP process is to implement an **Institutional Plan** for the effective management of State Dams. The focus on institutional arrangements is accompanied by a **Zonal Plan** together with a detailed **Strategic Plan**. In addition, a **Financial Plan** provides guidance on funding requirements and funding options. Together these components provide a comprehensive guide on the "what?"; "why?"; "how?" and "who?" of the management of prioritised Government Waterworks.

The RMP lays the foundation required to consolidate objectives for the resource, within the framework of existing policy priorities. The RMP also informs decision-making which may have a direct impact on the resource. Further, the RMP creates a platform to unlock economic potential at the Dam without compromising environmental principles and recreational use of the Dam. Recreational use includes activities which range from leisure, sport to culture and religion. Although recreational use is not consumptive, it is still a major water use and needs to be managed correctly to ensure increased personal, societal and economic benefits with minimal disturbances and environmental impacts.

RMPs are managed by the National Water Resource Infrastructure Branch (NWRI) of the Department of Water and Sanitation (DWS). This Branch is tasked with developing, operating and maintaining strategic water resource infrastructure in an efficient way to ensure that the needs of the Nation are met.

The RMP also provides a platform for coordination between different spheres of government that have official mandates regarding the management of the Dam. These Departments include:

*Table 1: Government Departments and Agencies*

| DEPARTMENT | MANDATE |
|---|---|
| **Department of Transport (DoT)** | Responsible for legislation, policy and regulations for all transportation in South Africa, including shipping and other transport by water or sea, including inland waterways. |
| **Department of Environmental Affairs (DEA)** | Responsible for biodiversity management within the Dam including Invasive alien species. DEA are also involved in the partnership to develop Luchaba Nature Reserve (LNR). |
| **Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (EC-DEDEAT)** | In the case of Mthatha Dam, EC-DEDEAT is responsible for the management of LNR which is adjacent to the Dam. They are also involved in the partnership with DEA for the development of a conference facility, restaurant and sunset bar. |
| **Eastern Cape Parks and Tourism Agency (ECPTA)** | ECPTA is involved in a partnership with DEA and EC-DEDEAT for the development of conference facility, restaurant and sunset bar. |
| **King Sabata Dalindyebo Local Municipality (KSDLM)** | Mthatha Dam is located in the KSDLM. In addition, the municipality is also involved in the partnership with DEA, EC-DEDEAT and ECPTA. |
| **Department of Water and Sanitation** | DWS is the official custodian of all surface water in South Africa. DWS is also responsible for the establishment, operation and maintenance of Government Waterworks (as per the National Water Act, 1998 (Act 36 of 1998). This includes management of Dam Safety and operation and management of Dams. |
| **South African Maritime Safety Authority (SAMSA)** | Administers and executes maritime related legislation and regulations. |

Each Government Department has its own suite of Legislation to govern the use and management of the Dam. The RMP consolidates these roles and functions into a coherent management platform.

The RMP presents the twenty-year vision of the Dam which is distilled into 5 year goals and annual Business Plans (BPs). Hence, the RMP is a tool aimed at meeting the expectations of users without sacrificing the environment.

# 2 WHERE ARE WE NOW?

## 2.1 Overview of the WMA

Mthatha Dam occurs within the Mthatha sub-area of Mzimvubu to Keiskamma Water Management Area (WMA) which lies predominantly within the Eastern Cape Province and borders on Lesotho to the north (DWAF, 2003). The WMA borders on the Fish to Tsitsikamma, Upper Orange and Mvoti to Umzimkulu WMAs (DWAF, 2003).

Of the 19 WMAs in the country, only the Mzimvubu to Keiskamma WMA is currently not linked to another WMA through intercatchment transfers (DWAF, 2003).

Climate over the WMA varies considerably, from humid and sub-tropical in the east to semi-arid in the west. Rainfall occurs mainly in summer and the mean annual rainfall ranges from 400mm to nearly 1 500mm (DWAF, 2003).

Vegetation is strongly influenced by the climate and varies from lush coastal forests to Karoo shrubbery and sparse grass in the west, with Savannah grassland covering most of the water management area. Rolling hilly terrain extends over most of the WMA, with the southern Drakensberg Mountains on the border with Lesotho as the main topographic feature.

### *2.1.1 Surface Water and River Systems*

The Mzimvubu to Keiskamma WMA has the highest mean annual runoff (MAR) in South Africa, representing nearly 15% of the total river flow in the country. About 40% of the total surface runoff from the WMA is from the Mzimvubu River catchment, and about 14% each from both the Kei and Mbashe River catchments (DWAF, 2003).

The main rivers include the Mzimvubu River with its main tributaries the Tsitsa, Tina and Mzimtlava Rivers,the Kei River, the Keiskamma River, the Buffalo River, the Mbashe River and Mthatha Rivers, all of which flow in a general south-easterly direction towards the Indian Ocean.

Due to the rolling topography there are no natural lakes in the area, although some wetlands are found in the vicinity of Kokstad. There are some estuaries in the WMA. Many of these are in a relatively pristine state, although not of a particularly high ranking from a species conservation perspective (DWAF, 2003).

The main storage Dams in WMA 12 are:

- Primary Catchment R: Sandile, Rooikrantz, Laing, Bridle Drift, Nahoon and Binfield Park Dams in the Amatola sub-area;
- Primary Catchment S: Wriggleswade, Waterdown, Xonxa, Doringrivier, Lubisi, Ncora and Butterworth (Xilinxa) Dams in the Kei sub-area; and
- Primary Catchment T: Mthatha Dam in the Mthatha sub-area.

In addition, there are four hydropower stations in the WMA including Collywobbles (42 megawatts), Ncora Dam (2,4 megawatts), First Falls (6 megawatts) and Second Falls (11 megawatts) (where water is released from Mthatha Dam) (DWAF, 2003).

According to the Eastern Cape State of the Environment Report (SoER) (EC-DEDEAT, 2009), the rivers in the Province are in a worse state than its terrestrial ecosystems and are under pressure, especially in the semi-arid western parts of the province where demands on limited water resources are high. The main issues faced by rivers in the Eastern Cape including the rivers in the WMA include:

- Catchment hardening modifies runoff into rivers, with reduced infiltration, greater risk of flooding during heavy rains, and reduced base flow in the drier seasons;
- Storage dams interrupt the natural flow regimes of the river, as well as ecosystem and geomorphological processes along the river channel;
- Over-abstraction reduces the availability of water for ecological processes in the river. It also modifies the natural flow regime, reducing the habitat suitability for in stream organisms;
- Reduced flows also threaten the integrity of estuaries at the river mouth;

- Invasive aliens occupy riparian zones, invade wetlands, and choke up tributaries. In so doing, they modify the runoff characteristics of the catchment, out-compete natural vegetation, reduce the habitat available to aquatic organisms and cause deep erosion of river channels and banks;
- Draining of wetlands for ploughing reduces the ability of a catchment to act as a sponge, absorbing excess water during heavy rains, and releasing it slowly during drier periods;
- Overgrazing reduces water infiltration to the soil and results in increased run-off and siltation of channels;
- Pollution output of industries is high, leading to water contamination; and
- Pollution modifies the water quality of natural aquatic systems. This results in algal blooms and excessive growth of certain vegetation types. This modifies ecosystem interactions within the aquatic environment. Some aquatic species such as the stone-fly (Plecoptera) are directly threatened by changes in the chemical and physical properties of water.

### *2.1.2 Land Use*

There are a large number of rural villages and settlements which occur throughout most of the WMA, and where large numbers of people live with relatively little economic activity in support. This results in most of the land-use activity in the area being based on subsistence and livestock farming.

Cultivation is practised in most parts of the WMA, with most of the irrigation in the vicinity of Kokstad and Matatiele to the north, and in the Queenstown/Elliot area. Large areas have also been planted with commercial forests, corresponding to areas of highest rainfall in the WMA.

The Mzimvubu to Mbashe Internal Strategic Perspective (ISP) (DWAF, 2005) noted that the land use of the area can be subdivided into the following:

- Subsistence farming in the former Transkei, mainly for maize, vegetables and cattle farming;
- Commercial agriculture, mainly livestock farming taking place in the upper parts of the Mbashe key area around Elliot, the western parts of the Mzimvubu key area around Ugie and Maclear and in the whole of the Mzimvubu key area that is part of the KwaZulu - Natal Province. There is significant commercial livestock farming in the Matatiele, Kokstad and Maluti areas of the Mzimvubu key areas;
- Commercial forestry is taking place in the upper catchments of the Mhtata key area above the Mthatha Dam, the Mzimvubu key area and the Mbashe key area; and
- A significant number of wetland areas occur in the northern parts of the Mzimvubu key area.

In the Mthatha Catchment of the WMA, veld and grazing for subsistence farming with cattle, goats and sheep occupy approximately 70 % of the catchment, with 15 % used for subsistence agriculture (vegetable and grain crops). Approximately 4 % of the Mthatha catchment is covered with commercial forest plantations, mostly in the headwater regions. Commercial water use is dominated by the forestry-related industries (Langeni and KwaBhaca sawmills), followed by the industrial, urban and rural sectors. The agriculture sector is poorly developed. Small-scale irrigation, particularly in the middle and lower reaches of the catchment, is mainly for subsistence agriculture and uses water pumped directly from the rivers using pumps (River Health Programme, 2008).

### *2.1.3 Water Quality*

Mineralogical water quality in terms of Total Dissolved Salts (TDS) for each of the sub-catchments within the WMA are listed below and were obtained from the Mzimvubu to Kieskamma WMA Situation Assessment (DWAF, 2002) It is important to note that this assessment was done in 2002 and used data from between 1994 and 1998 and thus may be outdated:

- Amatole Catchments (R catchments): The Keiskamma catchment has ideal water quality in its headwaters that changes to good in a downstream direction. Water quality in the Buffalo River catchment varies from good to marginal. The elevated

salts are the result of natural mudstones and industrial discharges in the King William's Town area. Water quality in the Nahoon and Gqunube catchments were classified as good;

- Kei Basin (S catchment): Water quality in the Kei Basin varies from ideal, in the Kubusi River catchment (S60), to good for the largest part of the catchment to marginal in the western part (S32) of the Basin. The elevated TDS in the western part of the catchment is largely the result of the catchment geology;
- Mbashe Basin (T10 and T90): There was insufficient data in the Mbashe Basin to classify the mineralogical water quality. However, the limited data that is available in the catchment indicates that the quality is probably ideal to good, which is similar to the adjacent catchments where the mineralogical quality was classified as good;
- Mtata Basin (T20, T70 and T80): With the exception of T70A and B, there was insufficient data in the Mtata Basin to classify the mineralogical water quality. However, the limited data available at sampling points in the Mtata River seem to indicate that the mineralogical status is ideal. In the Mngazi River, water quality was classified as good. The mineralogical quality is probably ideal to good over the remainder of the Basin;
- Mzimvubu Basin (T30): Water quality in the Mzimvubu Basin varied from ideal to good for most of the catchments; and
- Pondoland Catchment (T60): There was insufficient data to classify the mineralogical quality in the Pondoland coastal rivers. However, the limited data that is available in the T60 catchment indicates that water quality is probably ideal.

In addition, a number of key water quality issues have been identified:

- The quality of runoff in the former Transkei and Ciskei is dominated by runoff from extensive rural settlements. In the mid 1990s, 50% of the total population of the Eastern Province lived in the rural areas. Sanitation infrastructure was poor and concerns were expressed about microbial contamination of surface water that affected domestic water supply and contact recreation. Cattle have direct access to the water and they contributed to the microbial contamination (DWAF, 1998);
- Concerns were expressed about urban contamination from the Butterworth area (Du Preez, 1985) but not the Umtata area where it was concluded that releases for hydropower were sufficient to dilute urban contamination. However, the situation has deteriorated since then as a result of the growth of Umtata and the increased discharge of raw sewage into the Mtata River (DWAF, 2002), which is a severe health threat to rural communities downstream who use the water for household purposes;
- Elevated levels of iron and manganese were found by Du Preez (1985) which was ascribed to the natural abundance of red ochre soils in the region. Elevated iron and manganese can cause problems in the treatment of drinking water;
- Du Preez (1985) also found elevated levels of arsenic in rivers of the coastal plain. This was ascribed to cattle dipping in communal dips which were situated close to rivers (which served as the source of water for the dip). Old and unusable dip was discarded into soak pits which probably leached into surface water bodies;
- Water bodies in the Buffalo River suffer from eutrophication related water quality problems which are the result of nutrient enrichment (DWAF, 1999). Van Ginkel et al, (2000) found Laing and Bridle Drift Dams to be hypereutrophic (highly enriched) and that toxic cyanobacterial blooms are likely to develop. The origin of the nutrients is urban runoff and sewage effluent discharge; and
- Water hyacinth has also been observed in the Buffalo River system (DWAF, 2002).

### *2.1.4 The Social Environment*

About 3.5 % of the Gross Domestic Product (GDP) of South Africa originates from the Mzimvubu to Keiskamma WMA, which is relatively small compared to the large population in the area (DWAF, 2002). The largest economic sectors (1997) in the WMA, in terms of Gross Geographic Product (GGP), were:

- Government - 30.8 %;
- Manufacturing - 20.4 %;
- Trade - 14.7 %; and
- Finance - 11.4 %.

The government sector contributes the largest share of the GGP. One of the factors contributing to the importance of this sector is the presence of government services in the capital of the former Ciskei, Bisho, which houses the Provincial Legislature.

Activity in the manufacturing sector is dominated by the automotive, and textile and clothing industries. Mercedes Benz South Africa is the largest truck horse manufacturer in Africa and is the third largest Mercedes Benz manufacturing plant outside Germany. It also is one of the leading auto export companies in South Africa. Da Gama Textiles, which manufactures polyester-cotton fabrics, is one of the largest of its kind in the country. The food industry is also strong and the country's largest pineapple processing plants are operated in the East London area.

Trade is an important element of the activities around the East London harbour, while the finance sector mainly operates in support of other activities. Sheep and cattle farming provide a living for rural subsistence farmers. There is extensive commercial forestry in the WMA, while crops such as citrus, pineapples and chicory are grown on commercial farms (DWAF, 2002).

Most of the economic production is concentrated in the Buffalo City Metropolitan Municipality area from where more than 35% of the gross geographic product in the WMA originates.

Of the work force of just over one million people in the WMA in 1994, 42% were active in the formal economy and 48% were unemployed, which is substantially higher than the national unemployment average of 29%. Of those formally employed, 40% were active in the community services sector, i.e. government and social services, while 17% were involved in manufacturing and 16% in agriculture (DWAF, 2002).

More recent information is not available for the WMA at a whole however at a provincial level, Hamman and Tuinder (2012) noted that overall, the Eastern Cape contributes only 7% to South Africa's Gross Domestic Product (GDP) despite making up approximately 13.5% of the population. The economy has a lower contribution of the primary sector than other provinces due to the absence of a mining sector found elsewhere in the country. The primary sector (which includes agriculture, forestry, and to a lesser extent fishing and aquaculture) constitutes 7% of per capita gross value added (GVA) whereas the tertiary sector is proportionally larger than in other provinces, accounted for by the public sector services in the province (PGDP, 2004). The secondary sector is dominated by the transport equipment sub-sector but includes other industries such as food, beverages and tobacco products, textiles, and fuel, petrol, chemical and rubber products (PGDP, 2004). The industrial centre around Port Elizabeth and Uitenhague is the province's largest employer, specializing in vehicle manufacturing. In addition, a multi-billion Rand industrial development zone (IDZ) and deep water port are being developed in Coega (22km outside Port Elizabeth) to boost investment in export-oriented industries. Tourism is varied, depending on the different regions' attractions.

According to River Health Programme (2008), although the Mthatha Catchment of the WMA is heavily populated, it has a low level of economic development. The exception is Mthatha town where the government, commerce and educational institutions provide employment. Mthatha airport is situated to the north west of Mthatha town, close to Mthatha Dam. The Walter Sisulu University, previously known as the University of Transkei, is situated in Mthatha. The Hole in the Wall, Coffee Bay and Mthatha Mouth are some of the well-known holiday resorts along the coast. Subsistence farming occurs throughout the catchment.

Informal settlements naturally cluster near employment opportunities, such as the road works

to Ugie, the timber mills and Mthatha town. Employment per sector is provided in the table below and shows that most people in the catchment are not employed in the formal sector (83%).

*Table 2: Employment per Sector (River Health Programme, 2008)*

| Employment sector | Percentage of population |
|---|---|
| Mining and quarrying | 0.2 % |
| Electricity, gas and water supply | 0.1 % |
| Community, social and personal services | 6.3 % |
| Manufacturing | 0.4 % |
| Trade | 2.1 % |
| Private households | 2.7 % |
| Financial, insurance, real estate and business services | 1.1 % |
| Construction | 0.8 % |
| Transport and communication | 0.6 % |
| Agriculture, forestry and fishing | 0.4 % |
| Other and undefined | 2.3 % |
| Not employed in formal sector ** | 83.0 % |

### *2.1.5 Tourism Potential*

Tourism is currently active along the Coast at places like Port St Johns and Coffee Bay along the Wild Coast, and Hogsback in the Amatola Mountains (DWAF, 2002). However at this point it is not the main contributor to GGP in the WMA. At a provincial level, the Eastern Cape has developed a Tourism Master Plan (EC-DEDEAT, 2009) which noted that the province is home to a diverse range of natural attractions, from pristine coastlines to mountains, semi-deserts, world renowned nature reserves, and untouched wilderness areas. The province also has a diverse cultural and historical heritage, and is the birthplace of many Apartheid era struggle heroes. Situated along the popular Garden Route, the province links the strong tourism destinations of the Western Cape and KwaZulu-Natal. Despite this, the high tourism potential, this has not been optimally exploited to generate significant economic growth and development.

The province receives a fairly small amount of international visitors when compared to its provincial counterparts and in 2006 only received 7.6% of foreign visitors. This points to significant gaps in marketing, product availability, access, and use of competitive advantages. However it also suggests that there is scope for extensive expansion of the provincial tourism sector.

Sixty-one percent of international tourists come from Europe followed by Africa and the Middle East. The Americas constitute with 12% of international tourists while Asia and Australasia supply a mere 5% of the Eastern Cape international tourists. In terms of domestic tourists, during 2004, the Eastern Cape was visited by about 3,700,000 domestic tourists which amounts to an 8.3% share of the domestic tourism market (EC-DEDEAT, 2009).

Tourism products, in particular accommodation, are very spatially differentiated in the province. The areas requiring the most economic growth, namely the hinterland areas of the province, and the Wild Coast, have the least amount of accommodation available for tourists (EC-DEDEAT, 2009).

The Provincial Growth and Development Plan (PGDP, 2004) also noted that the Eastern Cape has the natural assets to become a major ecotourism destination. All seven of South Africa's biomes (ecological zones) are present, and the “Big 7” (the Big 5 plus whales and Great White Sharks) can be seen in the nature reserves and off the coast.The pristine Wild Coast of the former Transkei can become a major tourist attraction in its own. To this end, there are existing plans to expand the area of the nature reserves in the province to more than 400 000 hectares which aims to create an area of malaria-free parks. Improvement of facilities in the existing parks and reserves will take place by contracting out resorts to the private sector. In addition, the Wild Coast, one of the main tourism attractions of the Province and can become a major ecotourism attraction. The challenge is to develop tourism facilities while protecting the unspoilt environment and optimising socio-economic benefits to local communities. Major opportunities are to link the future Wild Coast Toll Road with a programme of upgraded rural access roads, and the development of the “Wild Coast Meander”, an all-weather low-impact link road to the coastal resorts.

The Province’s clear tourism advantages lie in ecotourism, adventure tourism, and in cultural and historical (or heritage) tourism. Three attractions are potential draws:

- Madiba Bay is being developed as a nature reserve and craft and cultural park within the Nelson Mandela Metropole;
- The Amatola Park and Living Museum; and

- The Nelson Mandela Museum, in Mthatha, Qunu and Mveso, can become a major local and international attraction, linked to the Wild Coast and to cultural tourism.

In addition to its proud tradition of struggle against the apartheid regime, the Eastern Cape has a rich Xhosa heritage that can provide the base for a vibrant community tourism industry similar to that of KwaZulu-Natal. Many community organisations and cooperatives are already starting arts, craft and cultural ventures. Market infrastructure is needed, including establishment of crafts and art centres to showcase community products. Also, the broader South African experience of community-based ventures needs to be integrated into tourism planning in the Eastern Cape, particularly to ensure that host communities retain maximum control of their cultural and, indeed, their natural resources (PGDP, 2004).

### *2.1.6 Catchment Management Agency*

There is no catchment management agency in place for the WMA.

### *2.1.7 Safety of Navigation*

In addition to its common law responsibility, DWS is, in terms of the requirements described in the National Water Act (Act 36 of 1998), amongst others, responsible for the safety of Government's Waterways and watercourses, including its Dams. DWS, its delegated public sector partner, or a delegated water management institution, has therefore the responsibility to provide the required fixed and/or floating[1] Aids to Navigation (AtoN) for general navigation.

Furthermore, Local Accountable AtoN Parties (LAAP) and other Bodies (clubs, commercial enterprises etc.) which provide access to the Dam have a responsibility to ensure that the required fixed and/or floating AtoN are provided. These bodies are required to obtain the necessary support and permission from DWS and SAMSA.

## 2.2 Purpose of Mthatha Dam

Mthatha Dam was built in 1977 and is an earthfill embankment Dam with a full supply capacity is 254 million m³. The Dam is built on the Mthatha River approximately 6 km north-west of Mthatha town (River Health Programme, 2008). Its main functions are to supply water to the city of Mthatha and associated peri-urban areas, and to regulate the flow of the Mthatha River for power generation at the two hydro-electric plants situated further downstream at First and Second Falls.

## 2.3 Overview of the Dam

The Mthatha Dam falls within KSDLM in the OR Tambo District Municipality (ORTDM) in the Eastern Cape. Below is an overview of the Dam.

*Table 3: Overview of Mthatha Dam*

| **Dam Characteristics** | |
|---|---|
| Year of completion | 1977 |
| Purpose | Industrial and domestic use and hydropower |
| River | Mthatha River |
| Nearest Town and Province | Mthatha town, Eastern Cape Province |
| Type | Earthfill Dam |
| Net Storage capacity | 253 million cubic metres |
| Wall height | 38 m |
| Crest length | 620 m |
| Material content of Dam wall | Concrete |
| Type and length of spillway | Horseshoe shape side channel; |
| Surface area of Dam at full supply | 2541.7 ha (21.41 km$^2$) |
| Owner, designer and construction | DWS |

[1] A marine AtoN is defined by the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) as "*A device or system external to vessels that is designed and operated to enhance the safe and efficient navigation of vessels and/or vessel traffic*".

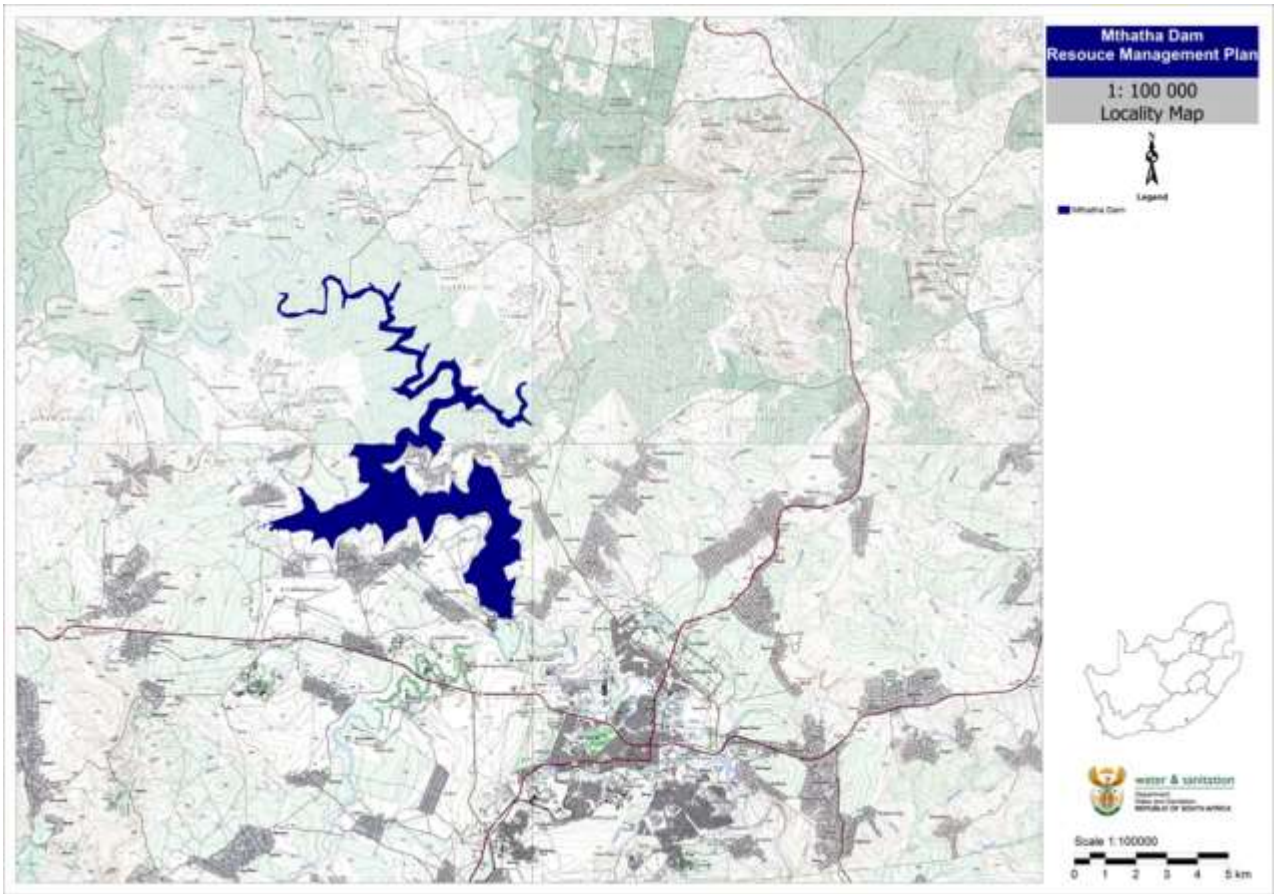


*Figure 2: Location of Mthatha Dam*

## 2.4 Legislative Framework

The RMP forms the overarching framework for the management of Mthatha Dam. It is informed by relevant policy, legislation and planning documents administered by other Government Departments. Similarly, these Government Departments are required to use the RMP to inform the development of future policy, legislation and planning documents.

The Mthatha Dam RMP was informed by the following policies, legislation, frameworks and strategies:

- Constitution of the Republic of South Africa, (Act 108 of 1996);
- National Water Act (Act 36 of 1998);
- Municipal Systems Act, 2000 (Act 32 of 2000);
- The Development Facilitation Act, 1995 (Act 67 of 1995);
- Communal Land Right Act, 2004 (Act 11 of 2004);
- Restitution of Land Rights Act, 1994 (Act 22 of 1994);
- Intergovernmental Relations Framework Act, (Act 13 of 2005);
- Disaster Management Act, 2002 (Act 57 of 2002);
- Water Services Act, 1997 (Act 108 of 1997);
- State Land Disposal Act, 1961 (Act 48 of 1961);
- Land Administration Act, 1995 (Act 2 of 1995);
- Environment Conservation Act (Act 73 of 1989);

- National Environmental Management Act (Act 107 of 1998);
- National Environmental Management Air Quality Act (Act 39 of 2004);
- National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004);
- National Environmental Management: Protected Areas Act (Act 57 of 2003);
- National Environmental Management: Waste Act (Act 59 of 2008);
- National Veld and Forest Fire Act, (Act 101 of 1998);
- Minerals and Petroleum Resources Development Act (Act 28 of 2002);
- National Heritage Resources Act (Act 25 of 1999);
- Conservation of Agricultural Resources Act (Act 43 of 1983);
- Tourism Act (Act 72 of 1993);
- South African Maritime Safety Authority Act (Act 5 of 1998);
- National Sport and Recreation Act (Act 110 of 1998 as amended);
- Safety at Sports and Recreational Events Act (Act 2 of 2010);
- Game Theft Act (Act 105 of 1991);
- Merchant Shipping (National Small Vessel Safety) Regulations, 2007
- National Environmental Management Act EIA Regulations (2010);
- South African National Biodiversity Institute (SANBI) Biodiversity Geographic Information System information;
- Nature and Environmental Conservation Ordinance, 1974 (No 19 of 1974);
- Eastern Cape Parks and Tourism Agency Act, 2010 (Act 2 of 2010); and
- Sport and Recreation SA Strategic Plan - 2011-2015.

The Section below provides an overview of how the RMP has considered some of key policies, legislation and strategies.

### *2.4.1 National Water Act (Act 36 of 1998)*

The Act aims to ensure that the Nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account (amongst other factors):

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use; protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting Dam safety; and
- Managing floods and droughts.

Further, Section 113 of the Act makes provision for the recreational use of Dams. It further allows that the Minister may control or prohibit access to Dams and make reasonable charges for the a.) use of; b.) entrance into; and c.) use of any water surface or land associated with any Government Waterworks for recreational purposes.

The definition of water use in the Act includes the use of water for recreational use (Section 21k). Based on this requirement, the Department has published guidelines for recreational use of water and requires the following:

- DWS structures or infrastructure in and around water resources need to be constantly protected and maintained;
- Enforcement through mechanisms such as a Zonal Map, which is developed as part of the RMP process, is essential to resolve conflict amongst users both within the recreational water use; e.g. skiing vs. angling, or with other uses; e.g. agriculture;
- An appropriate degree of policing of irresponsible use should be maintained;

- Establishing water management institutions for the water resource users allows the institutions to charge for their activities therefore improving management and policing which instils a sense of ownership and responsibility among users; and
- Involving Public Private Partnerships (PPPs) could address commercial use but also assist with safety management at the Dam.

Once the RMP has been gazetted, the RMP will regulate access and use of the Dam. It is important to note that users will need to comply with other relevant legislation including the Merchant Shipping (National Small Vessel Safety) Regulations, 2007, The National Water Act, 1998 (Act No 36 of 1998), SAMSA Marine Notices and its Directive on the Standardisation of fixed and floating AtoN and Demarcation Markers on all navigable Inland Waterways in the Republic of South Africa and the relevant provincial ordinances.

According to DWAF (2007) Internal Guideline: Generic Water Use Authorisation Application Process, the term Recreational Water Use (RWU) encompasses the uses of water, including the surface, for:

- The exclusive purpose of sport, tourism or leisure;
- Personal or commercial recreational water use; and
- Activities which contribute to the general health, well-being and skills development of individuals and society.

In addition, the only water use entitlement that currently applies to RWU is Schedule 1 of the Act. Currently the Act is silent on Commercial RWU (although the Strategic Plan for Commercialisation (2009) does deal with Commercial RWU) and thus it is necessary for the RMP to provide guidance this regard.

### *2.4.2 GN 654 of May 1964*

The only Departmental Regulations limiting RWU at Government Waterworks is Government Notice (GN) R654, dated 1 May 1964.

These Regulations are read together with section 113 of the National Water Act (Act 36 of 1998) and only apply to the water surface and surrounding State Land of a State Dam, and not to other water resources.

The Regulations provide guidance on access control, use of firearms and other weapons, speed limits, parking areas, trading, reserved areas, fire management, hygiene, camping and accommodation, access to works, photography, safety rules, reckless and unseemly conduct, damage to property, prohibited areas, protection of fauna and flora, swimming, angling, boat Regulations, water skiing and hydroplaning; and general rules.

### *2.4.3 Water Services Act (Act 108 of 1997)*

The Act outlines the roles and responsibilities for the supply of water and sanitation to citizens. It also recognises the rights of all humans to basic water supply and sanitation services. The management of the Dam cannot compromise the purpose of the Dam especially if it is for domestic water supply.

### *2.4.4 National Environmental Management Act (Act 107 of 1998) as Amended*

The National Environmental Management Act (Act 107 of 1998), or NEMA, as it is simply known, is the foundation piece of legislation for environmental management in South Africa.

Section 2 of the Act has the largest impact on the RMP in that future development and management of the Dam must ensure the following:

- The disturbance of ecosystems and loss of biological diversity both in and around the Dam must be avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- Pollution and degradation of the Dam is avoided, or, where it cannot be altogether avoided, is minimised and remedied;

- The disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied;
- Development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised;
- A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions; and
- Negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

Coupled with these considerations, the following is stipulated with regards to integrating social and economic aspects into the purely biophysical aspects of the environment:

> *"Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option."* ***(National Environmental Management Act, 1998 (Act 107 of 1998)***

### *2.4.5 National Environmental Management: Protected Areas Amendment Act (Act 15 of 2009)*

The National Environmental Management: Protected Areas Amendment Act (NEMPA) (Act 15 of 2009) ensures the protection and conservation of ecologically viable areas in the country. It further seeks to achieve co-operative environmental governance and to promote sustainable and equitable utilisation and community participation.

### *2.4.6 The National Environmental Management: Biodiversity Act (Act 10 of 2004)*

The National Environmental Management: Biodiversity Act (NEMBA) (Act 10 of 2004) provides for the consolidation of biodiversity legislation through establishing national norms and standards for the management of biodiversity across all sectors and by different management authorities.

Chapter 4, Part 2 of the Biodiversity Act provides a listing of species as threatened or protected. If a species is listed as threatened, it must be further classified as critically endangered, endangered or vulnerable. The Act defines these classes as follows:

- **Critically endangered species**: any indigenous species facing an extremely high risk of extinction in the wild in the immediate future.
- **Endangered species**: any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species.
- **Vulnerable species**: any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species.
- **Protected species:** any species which is of such high conservation value or national importance that it requires national protection. Species listed in this category will include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Certain restricted activities are regulated on listed species using permits by a special set of regulations published under the Act. Restricted activities regulated under the Act are keeping, moving, having in possession, importing and exporting, and selling. The first list of threatened and protected species published under NEMBA was published in the government gazette on the

23rd of February 2007 along with the Regulations on Threatened or Protected Species. Many Dams around South Africa are likely to have threatened or protected species. The management of these species in line with NEMBA must be taken into account in the RMP and by managers at the Dam.

### *2.4.7 National Environmental Management: Biodiversity Act (Act 10 of 2004): Alien and Invasive Species Lists, 2014 (GN 599 of 2014)*

The Alien and Invasive Species Lists were promulgated on 1 August 2014. They provide certain prohibitions of use of Invasive alien species. This includes Catch and release of a specimen of a listed invasive fresh-water fish or listed invasive fresh-water invertebrate species. However certain exemptions apply depending on the area and species in question. The details are provided in Notice 3 of the Species List and include:

| Species | Category/Area |
|---|---|
| Common carp | a. 1b in National Parks, Provincial Reserves, Mountain Catchment Areas and Forestry Reserves declared in terms of the Protected Areas Act.<br>b. 2 for release into a dam within a discrete catchment system in which it occurs.<br>c. 3 in all rivers, wetlands, natural lakes and estuaries in which it occurs.<br>d. Subject to b, common carp is not listed for dams within discrete catchment systems in which it occurs. |
| Small-mouth bass | e. 1b in National Parks, Provincial Reserves, Mountain Catchment Areas and Forestry Reserves declared in terms of the Protected Areas Act.<br>f. 2 for release into dams within discrete catchment systems in which it occurs<br>g. 3 in all rivers, wetlands, natural lakes and estuaries in which it occurs.<br>h. Subject to (b), each listed bass species is not listed for dams within discrete catchment systems in which it (the specific listed bass species) occurs. |

Smallmouth Bass and Carp have been noted at the Dam and the Dam falls within the LNR. However, smallmouth bass and common carp are exempted listed as category 2 for a period of two years from the date upon which this notice takes effect, from requiring a Permit for any restricted activity in terms of the Act or Alien and Invasive Species Regulations, 2014, provided a person is in possession of a valid Provincial Permit issued in terms of Provincial legislation where required for the species.

### *2.4.8 The National Environmental Management: Biodiversity Act (Act 10 of 2004): Alien and Invasive Species Regulations (GN 33683 of 19 July 2013)*

The Alien and Invasive Species Regulations require the development and coordination of Species Management Programmes for all Invasive Species listed in Category 1B.

These species management programmes must stipulate the following:

- The listed invasive species to which it relates;
- The measures to eradicate or control the listed invasive species;
- The areas in which the measures are to be applied; and
- The schemes to fund the measures, if applicable.

Species monitoring, control and eradication plans are also required and the Department will publish guidelines on the compilation of these documents within a year of the publication of the regulations.

The Regulations provide for a register of alien and listed invasive species to be compiled. In addition, all research on invasive species needs to be lodged. This has implications for the RMP as any small-scale fishery proposals or alien invasive management plans will need to be approved in line with these regulations.

### *2.4.9 The Municipal Systems Act (Act 32 of 2000)*

The Municipal Systems Act (Act 32 of 2000) serves to provide the framework to enable

municipalities to ensure access to essential services to their citizens. The Act gives priority to the basic needs of the community, but also gives local government the freedom to set tariffs, and charge for services independently of other municipalities, providing that decisions made are in the best interest of the community.

The Act is of particular relevance to the RMP process, as it requires integrated planning from all spheres of government to ensure equitable and accessible municipal services. This means that any planning or policy-making must be in line with local government policies, planning and initiatives.

#### *2.4.10 Conservation of Agricultural Resources Act (Act 43 of 1983)*

The Conservation of Agricultural Resources Act (CARA) (Act 43 of 1983) seeks to provide 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.

Given that much of the land surrounding the Dam is State Owned Land it needs to be managed in such a way that it reduces the threat and spreading of invasive alien species.

In addition, Invasive Alien Plants are known to use significant volumes of water in correlation to the plants biomass and thus affect the volume of water available for use.

#### *2.4.11 Public Finance Management Act (Act 29 of 1999)*

Section 76 of the Public Finance Management Act (PFMA) (Act 29 of 1999) provides for the making of Regulations for governing the efficient use and financial management of State Resources.

The object of the Act is to secure transparency, accountability and sound management of the revenue, expenditure, assets and liabilities of Government Departments.

The Act promotes the objective of good financial management in order to maximise service delivery. The Act allows DWS to enter into Public Private Partnership (PPP) agreements with the private sector for the commercial use of state assets.

#### *2.4.12 Treasury Regulations of 15 March 2005*

Section 16 of the Treasury Regulation provides guidance on PPP including the process that needs to be followed, procurement and management of PPPs.

#### *2.4.13 Safety at Sports and Recreational Events Act (Act 2 of 2010)*

The purpose of the Safety at Sports and Recreational Events Act (Act 2 of 2010) is to provide measures to safeguard the physical wellbeing and safety of people at at sports, recreational, religious, cultural or similar events held at stadiums, venues or along a route. It also provides for the accountability of event role-players. The Act also provides for Access Control Officers which can be appointed by the Event Organisers. These officers control access of both people and motor vehicles to an event and prevent a person from entering or requesting that a person leaves should the need arise. The act also allows for Peace Officers to be in charge of search and seizures at an event.

The Act also specifies that an Event Planning and Safety Committee must be set up for all events categorized as medium or high risk. This committee should include the following stakeholders:

- The National Commissioner or an authorised member;
- A local authority disaster management department or centre;
- A controlling body, in respect of high-risk events only;
- A stadium or venue owner;
- The event organiser; and
- An emergency service provider.

#### 2.4.14 *Merchant Shipping (National Small Vessel Safety) Regulations (GN.R 705 of 8 August 2007)*

The National Small Vessel Safety Regulations, 2007 were promulgated under Section 356 of the Merchant Shipping Act (Act 57 of 1951) and provides a number of requirements including:

- Vessel Safety Requirements; and
- Crewing.

It also provides the provision of an Enforcement officer who can board and inspect a small vessel and its appliances and equipment, ask any pertinent questions of, and demand all reasonable assistance from the owner or skipper or any person who is in charge or appears to be in charge of the vessel. The enforcement officer may request documents or certificate required by these regulations etc. to be produced. An Enforcement officer may, in order to ensure compliance with these regulations and in the interests of public safety direct the movement of a vessel or prohibit the operation of the vessel.

#### 2.4.15 *South African Maritime Safety Authority Act (Act 5 of 1998)*

One of SAMSA's three legislative mandates is "to ensure safety of life and property at sea". The Act enables SAMSA to administer and execute the relevant maritime legislation.

#### 2.4.16 *Provincial Parks Board Act (Act 12 of 2003)*

Provincial Parks Board Act, 2003 provided for the establishment of the Eastern Cape Parks and Tourism Agency (ECPTA) now called Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (EC-DEDEAT) as a Public Entity.

The EC-DEDEAT mandate is to ensure biodiversity conservation and sustainable utilisation of natural resources inside the province's Nature Reserves.

#### 2.4.17 *Nature and Environmental Conservation Ordinance (No 19 of 1974)*

The aim of the Nature and Environmental Conservation Ordinance, 1974 was to consolidate and amend the laws relating to nature and environmental conservation including the establishment of the Department of Nature and Environmental Conservation, establishment of provincial and local nature reserves, protection of fish in inland waters, management of angling, management of noxious aquatic weeds and protection of wildlife and flora.

#### 2.4.18 *Eastern Cape Parks and Tourism Agency Act (Act 2 of 2010)*

The aim of the Act is to provide for the establishment of the ECPTA in order to develop and manage protected areas, to promote and facilitate the development of tourism in the Province and to confer powers, functions and duties upon that Agency; to provide for the management thereof by a Board and the appointment of members thereof; to establish the Eastern Cape Tourism Development Fund and the Eastern Cape Biodiversity Conservation and Development Fund; to provide for the registration of certain persons and amenities involved in tourism; to provide for the collection of levies in respect of registered persons and amenities; to provide for the inspection of premises.

## 2.5 Existing Plans

An RMP cannot function in isolation and so all associated planning initiatives must be considered and used to inform the development of the RMP.

The following planning initiatives were taken into account in developing the RMP:

- The Integrated Development Plan (IDP) of KSDLM and ORTDM;
- The Water Services Development Plan of KSDLM;

- The Strategic Framework of Water Services, 2003;
- The Provincial Spatial Economic Development Strategy, 2003;
- National Spatial Development Perspective, 2006;
- The New Growth Path, 2012; and
- The Cooperative Inland Waterways Safety Programme.

Figure 3 below provides an overview of how the RMP is informed by existing plans at different spheres of government.


*Figure 3: Relationship between RMP and Planning Initiatives*

### *2.5.1. The Cooperative Inland Waterways Safety Programme*

The Cooperative Inland Waterways Safety Programme (CIWSP) project is a partnership between multiple government entities and between the government and the community. The aim is to enhance the development of a best practice model to ensure a safe and structured inland maritime environment and culture, whilst protecting the country's precious water resources. Although Mthatha Dam is not one of the Pilot Dams for this project, this RMP

integrates information from the CIWSP into the management objectives for this Dam.

## 2.6. Socio-Economic Environment

KSDLM is situated in the Eastern Cape and comprises two magisterial areas, viz. Mthatha and Mqanduli and their surrounding rural areas. The municipality is largely rural in character with the urban areas concentrated around the towns. It is 3 028 km$^2$ in extent and had a population of 444 832 persons in 2007, which rose to 451 710 in 2011. Unless otherwise indicated, all information in the section was obtained from the Census 2011 (Statistics South Africa, 2011) data.

### *2.6.1. Population*

According to Census 2011, the population of the municipality comprises mainly black African people of which the majority is Xhosa speaking. In addition, 53.9% of the population is female.

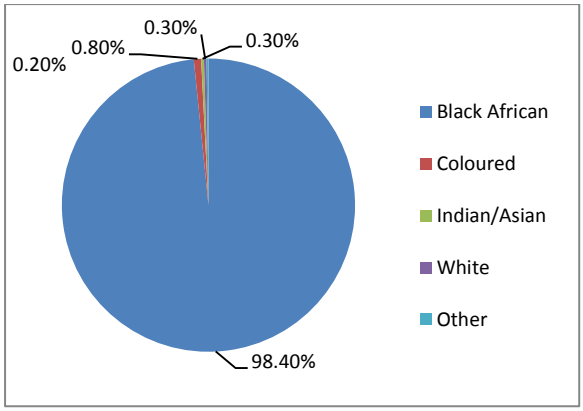


*Figure 4: Population*

### *2.6.2. Education*

Census 2011 data shows that 48.8% of the population have received some primary school education with only.

Figure 5 below shows that only 6.9% of the population had completed matric.

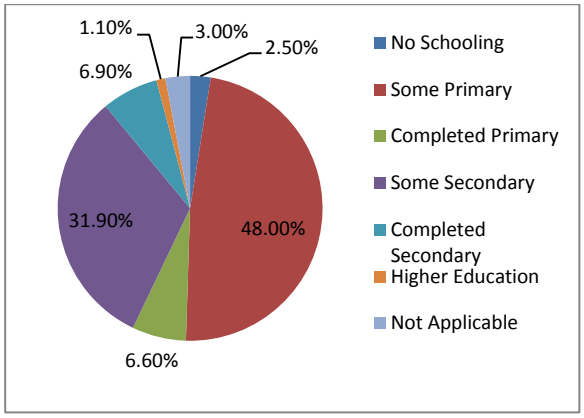


*Figure 5 : Education Level*

### *2.6.3. Employment*

Figure 6 shows that 33.27% of the population in KSDLM are employed however, 49.26% of the population is not economically active. Agriculture is the main economic activity in the municipality and many people are reliant on subsistence farming.

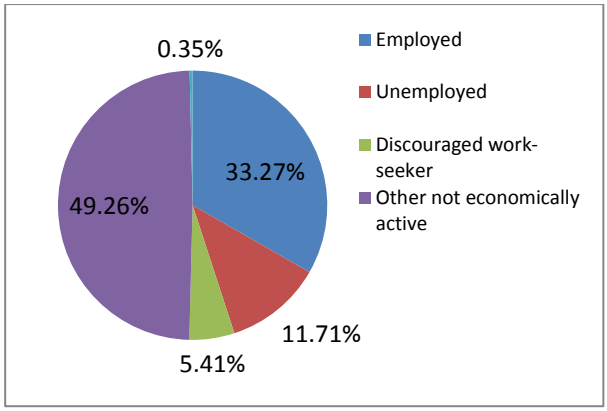


*Figure 6: Employment Status*

### 2.6.4. *Average Household Monthly Income*

Average income is grouped into the following brackets:

- No income;
- R1 - R4,800;
- R4,801 - R9,600;
- R9,601 - R19,600;
- R19,601 - R38,200;
- R38,201 - R76,4000;
- R76,401 - R153,800;
- R153,801 - R307,600;
- R307,601 - R614,400;
- R614,001 - R1,228,800;
- R1,228,801 - R2,457,600; and
- R2,457,601+.

Figure 7 below shows average household income per month for 2011. The majority of households are earning between R9 601 and R19 600 per month. However, 16.7% do not receive any income at all.

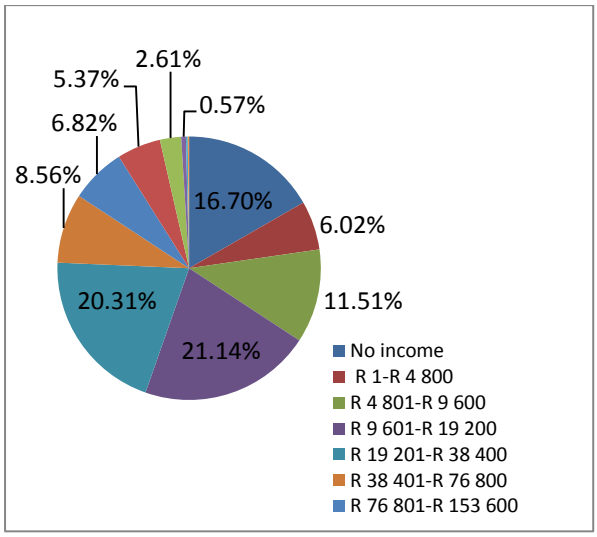


*Figure 7: Income status*

### 2.6.5. *Gross Value Added*

Gross Value Added (GVA) is defined as the total value of all the goods produced in a specific area during a specific period.

Quantec Research defines the major sectors into Primary Sector, which is extractive, Secondary Sector, made up of manufacturing and the Tertiary Sector, which comprises of services. The Table below shows the GVA per sector for 2011. This data is taken from Quantec Research and the variables are explained below.

**Primary Sector:**

- Agriculture, forestry and fishing; and
- Mining and Quarrying

**Secondary Sector:**

- Manufacturing. This includes food, beverages and tobacco; textiles, clothing and leather goods; wood, paper, publishing and printing; petroleum products, chemicals, rubber and plastic; other non-metal mineral products; metals, metal products, machinery and equipment; electrical machinery and apparatus; radio, TV, instruments, watches and clocks; transport equipment; and furniture and other manufacturing.
- Electricity, gas and water; and
- Construction

**Tertiary Sector:**

- Wholesale and retail trade, catering and accommodation. This sector represents the tourism sector through catering and accommodation and the sale of goods through trade.
- Transport, storage and communication;
- Finance, insurance, real estate and business services;
- Community, social and personal services; and
- General Government

Table 4 below shows that the greatest contribution is from General Government (R2 294 million) and Finance, Insurance, Real Estate and Business Services (R1 467 million). Despite its prevalence in the region, agriculture only contributes R252 million (3%).

*Table 4: Regional output and GVA at basic prices by 2006 local municipality 1995-2013* (v1 20Jun14)*

| Regional output and GVA at basic prices by 2006 local municipality 1995-2013* (v1 20Jun14) | | |
|---|---|---|
| | R millions | % |
| Agriculture, forestry and fishing | 252 | 3% |
| Mining and quarrying | 8 | 0% |
| Manufacturing | 1164 | 15% |
| Electricity, gas and water | 47 | 1% |
| Construction | 179 | 2% |
| Wholesale and retail trade, catering and accommodation | 1081 | 14% |
| Transport, storage and communication | 613 | 8% |
| Finance, insurance, real estate and business services | 1467 | 18% |
| Community, social and personal services | 893 | 11% |
| General government | 2294 | 29% |
| **Total** | **7998** | **100%** |

## 2.6 Development Potential

The development potential of Mthatha Dam is extremely high. The Dam is located in close proximity to Mthatha Airport which is the only airport in the region and acts as a gateway to a number of tourism destinations including the Nelson Mandela Museum in Mthatha, Coffee Bay, Hole in the Wall and the Wild Coast. The Airport is also currently undergoing upgrading and it has a number of facilities such as car rental for both business and tourism.

The DEA, EC-DEDEAT, KSDLM and ECPTA have developed a conference facility and sunset restaurant at LNR on the shoreline of the Dam. The facility is not yet operational however there is potential for it to be developed further to include accommodation, public facilities etc.

According to the Eastern Cape Tourism Master Plan (EC-DEDEAT, 2009), Metrorail has routes to East London, Port Elizabeth and Mthatha (with the Mthatha – East London route being recently refurbished) and there is significant potential for increased use of rail transport infrastructure for ourism.

Sikrweqe (2013) also noted that tourism has enormous economic potential in KSDLM. Plans to promote tourism within the municipality included, amongst others, the Nelson Mandela Museum, Mvezo Museum, the development of Qunu Village, and Coffee Bay and Hole-in-the-Wall coastal areas. Other tourist attractions in the area include Luchaba Game Reserve, Nduli Nature Reserve, Jonopo Cultural Village, and several small craft centres. Poor infrastructure in the area including poor roads, services, signs, accommodation etc. have the potential to negatively impact the growth of the area.

## 2.7 Access and Infrastructure

There is no formal access area at the Dam however the local community does make use of the Dam for picnics, fishing and swimming. Most of the Dam is not fenced and therefore the community can access the Dam at multiple points.

The Department of Environmental Affairs (DEA), EC-DEDEAT, KSDLM and ECPTA have developed a conference facility and sunset restaurant at LNR on the shoreline of the Dam. There is no slipway in place at this point.

DWS has offices at the Dam. They are also responsible for the management of the main Dam infrastructure which includes the Spillway. There is no formal slipway as boats can be launched directly from the shore.

Infrastructure for abstracting water for the Rosedale Purification Plant occurs in the Dam.

An unauthorized abstraction point is also in place and was used to provide water to an Essential Oil Agricultural Pivot Field. The status of the project is not known.

A number of community houses also occur along the shoreline of the Dam.

## 2.8 Biophysical Environment

### *2.8.1 Water Quality*

The water quality at the Mthatha Dam has been monitored by DWS since 1980. The average values during the period between 1980 and 2014 are provided below for Monitoring Point T20_102582 (Table 5). However, water quality

was not monitored during 1983 to 1998. The levels of Phosphorous (P) in the Dam over the monitoring period is a concern.

*Table 5: Water Quality at Mthatha Dam*

| Variable | Average (1976-2013) |
|---|---|
| Calcium (Ca) | 4.40 |
| Chloride (Cl) | 7.80 |
| Dimethyl sulphide (DMS) | 61.43 |
| Electrical Conductivity (EC) | 8.95 |
| Fluoride (F) | 0.14 |
| Potassium (K) | 1.50 |
| KJEL_N_Tot_Water | 0.59 |
| Magnesium (Mg) | 2.54 |
| Sodium (Na) | 6.67 |
| Amonia (NH4_N) | 0.06 |
| Nitrates (NO3_NO2) | 0.34 |
| Phosphorous (P) | 0.08 |
| pH | 7.51 |
| Phosphates (PO4_P) | 0.05 |
| Silicon (Si) | 5.40 |
| Sulphates (SO4) | 7.43 |
| Total Alkalinity (TAL) | 22.90 |

The Maucha Diagram below shows that the Total Alkalinity (TAL) is high (Figure 8).

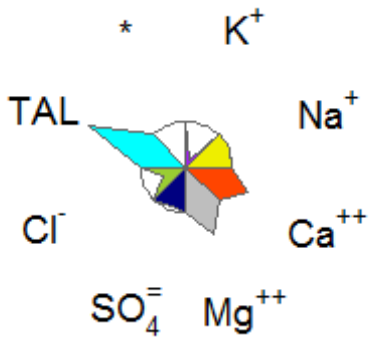


*Figure 8: Maucha Diagram for Mthatha Dam*

Fatoki et al. (2001) also undertook an assessment of water quality along the Mthatha River including sites at the Dam. The study found that high levels of coliforms were found at all sites. Based on the South African guideline value of 0 counts /100 ml faecal and 10 counts/100 ml total coliforms (DWAF, 1996a; Quality of Domestic Water Supplies, 1998), the water from the river was not suitable for direct domestic use and may pose a health risk to the river-bank communities. The faecal coliform levels also did not fall within the guideline value of 0 to 130 counts/100 ml set for full-contact recreation (DWAF, 1996b). At this level there is a risk of contracting gastrointestinal illness as a result of full-contact recreation or direct consumption of untreated water (DWAF 1996 a and b). This is a major encumbrance as it limits recreation at the Dam. It also has health implications as the Dam is currently used for swimming (a primary contact activity) by the local community. In addition, the faecal coliform values in the river at most sites are also higher than the South African guideline of 200 counts/100 ml for water used for livestock watering (DWAF, 1996c) and its use to feed livestock in the catchment could pose a significant health risk to animals.

The study noted that the main causes of this were contributions from peri-urban- and urban runoffs from informal settlements and contamination of the river by domestic animals (Fatoki et al., 2001).

Eutrophication is a complex process in which fresh and marine waters become enriched by nitrogen, phosphorus etc from both internal and external sources (Xu, et al., 2007; Nyenje, et al., 2010). Nutrient levels at the Dam are high and show a relatively eutrophic system. The World Health Organisation (WHO) and South African safe limit for nitrate in domestic water for lifetime use is 10 mg/l as N (WHO, 1984; Quality of Domestic Water Supplies, 1998). This nitrate level is exceeded at some points and makes water unsuitable for direct domestic use as this may expose infants and pregnant women to the risk of methaemoglobinemia (Bush and Mayer, 1982; Canter, 1987). The phosphate (P) level was also relatively high. The South African guideline for P in water systems that will reduce the likelihood of algal and other plant growth is 5 mg/l (DWAF, 1996d). Further, eutrophication-related problems in temperate zones aquatic systems begin to increase at ambient total P concentrations exceeding 0.035 mg P/l. The high nutrient levels may be due to diffuse sources from settlements and agricultural runoffs (Fatoki et al., 2001).

Eutrophication is one of the most pressing environmental problem in both developing and developed countries (Xu, et al., 2007; Kohzu, et al 2008). It alters ecological integrity, cause fish

extinction and toxic algal blooms (Mzamo, 2013, Xu, et al., 2007).

As mentioned, the nitrate and phosphate levels are above the recommended levels. It is accepted that these levels represent nutrient thresholds, beyond which there will be a corresponding increase in the risk and intensity of water quality problems (OECD, 1982). Further, eutrophication could lead to the growth of blue-green algae, which could release toxic substances (cyanotoxins) into the water. Cyanotoxins are recognised to have caused the death of farm livestock (Holdsworth, 1991). This phenomenon, which could occur in the Dam because of its high nutrient levels, could also pose a health risk to the community livestock. In addition, these bacteria are capable of producing a number of toxins including β-N-methylamino-L-alanine (BMAA).

Studies by Esterhuzien-Londt (2010) evaluated BMAA which is produced in most cyanobacterial blooms. This has potential negative impacts on human health as very low BMAA concentrations are required to yield neurological damage and even motor neuron death. However, the extent of the risk to humans from direct exposure of free BMAA in these waters remains unknown (Esterhuizen-Londt, 2010). BMAA was first detected in 2005 and thus the necessary tolerable daily intake and guideline values for BMAA have not been established. In addition there is limited information on prevalence, incidence, and toxicology. The efficiency of standard water treatment processes to remove other cyanotoxins such as microcystin has been extensively studied but no studies on the removal of BMAA have been undertaken. As Mthatha Dam is used for domestic use, this lack of information can have extremely negative implications.

Fortunately, Esterhuzien-Londt (2010) found that in the absence of dissolved organic carbon in the water, BMAA is efficiently removed by sand filtration, chlorination by calcium hypoclorite, and powdered activated carbon during water treatment. However, flocculation was not effective in BMAA removal and the ozone concentrations achieved were not sufficient to result in BMAA removal.

In addition, BMAA was detected as both free and protein-associated fractions in *Clarias gariepinus* (Catfish), and *Crocodylus niloticus* (Crocodile) liver samples. BMAA content increased from the fish to the crocodile. BMAA content in the crocodile samples increased with age and thus bioaccumulation does appear to occur. The local community does use the Dam for occasional subsistence fishing and thus this BMAA bioaccumulation potential is another potential issue.

Most trace metal concentrations are not an issue at the Dam however Cadmium (Cd) levels are high and above the South African guideline limit of 0.005 mg Cd/l in water for domestic use (DWAF, 1996a; Quality of Domestic Water Supplies, 1998). Fatoki et al. (2001) noted that the probable source of Cd was most likely natural sources due to the geological formation of the catchment as well as from runoff from agricultural soils where phosphate fertilisers have been applied Other probable sources include leachates from disused Ni-Cd based batteries and cadmium-plated items (Hutton et. al. 1987; Stoeppler, 1991) from the rural communities that are disposed in the refuse dumps in the settlements as the leachates from these dumps can easily be washed into the river by rain and Dam. These high levels are a major encumbrance as Cd is extremely toxic and the primary use of water high in Cd could cause adverse health effects to consumers (Quality of Domestic Water Supplies, 1998). The use of water from the river and Dam for livestock watering may also expose the livestock to chronic Cd metal poisoning.

Fatoki et al. (2001) also found that the pollution of the river and the Dam was negatively affecting the water purification systems in Mthatha which may increase the cost of treating the water to potable standards.

Turbidity is an issue at Mthatha Dam and the sampling site within the Dam did not meet the South African guideline of 0.1 NTU for turbidity in water for domestic use (Quality of Domestic Water Supplies, 1998). The high level of turbidity may also negatively impact recreational use as it creates the perception of 'dirty' water (Fatoki et al. ,2001). The River Health Programme (2008)

found that impacts on the water resources in the area included agricultural activities and livestock grazing in the riparian zone destroy riparian vegetation, which ultimately results in increased erosion and in-stream sediment deposits and eventual in-stream habitat loss.

The formation of gullies or dongas also adds to sedimentation of the Dam (and related turbidity). Gully erosion occurs throughout South Africa but is particularly common in the Mthatha district (River Health Programme, 2008). Gullies usually develop on relatively flat land in valley bottoms and low-angled foot slopes that have high agricultural value and are usually created when running water removes soil from the land surface. Common processes for gully formation are when surface flow becomes concentrated into furrows called rills, or when surface flow infiltrates into the soil profile causing cavities or soil pipes underground. Surface flow develops when the soil surface is bare of vegetation cover which may be caused by overgrazing, poor land management and changes in land use. The formation of gullies may also occur even when there is no concentrated surface flow is due to a combination of geology, soil and climatic conditions. In the Mthatha area, soils are acidic and contain dispersive clays which cause the soil to crack after wetting and drying. These cracks provide preferential zones of infiltration for water during rainfall events. Water is able to percolate through the profile and remove material which causes vertical cracks to widen which ultimately leads to collapse and gully extension (River Health Programme, 2008).

*Figure 9: A Donga (Gully) at Mthatha Dam*

### *2.8.2 Flora*

#### 2.8.2.1 Aquatic Invasive Plant Species

Currently 14 alien aquatic and wetland plant species are declared weeds or invader plants in South Africa and their control is subject CARA, Act 43 of 1983, and amended in 2001. Another 13 species have been proposed for listing under CARA and NEMBA, Act 10 of 2004. There are also a number of indigenous or cosmopolitan (world-wide) species that can flourish and become troublesome in disturbed aquatic habitats.

No aquatic invasive plant species were noted as a problem during the stakeholder consultation however according to the Agricultural Geo-Referenced Information System (AGIS) Weeds and Invasive Plants (WIP) Database, *Eichhornia crassipes* (water hyacinth) occurs in the 3128DA and 3128BC Quarter Degree Grids Square (QDS) in which the Dam occurs.


*Figure 10: Water Hyacinth (SAPIA, 2010)*

The River Health Programme (2008) also noted water hyacinth along the Mthatha River although currently below the Dam wall. Dense mats can completely cover water bodies in a relatively short time if left unchecked which can impede water flow, block sunlight from reaching indigenous aquatic plants, and starve the water of oxygen, which in turn affects fish and aquatic invertebrates. The plants also create a good habitat for insect disease vectors such as mosquitoes (River Health Programme, 2008). Although, no infestation is currently noticeable on the Dam, the occurrence of water hyacinth on the Mthatha River and in the QDS around the Dam strongly suggests that the species is likely

to occur at the Dam in the future which is a serious encumbrance.

Water hyacinth is indigenous to the New World tropics, with its centre of origin in Amazonia, Brazil (Barrett & Forno 1982). To date the distribution of water hyacinth is mostly pan-tropical, but it also occurs in warm temperate regions of the world, extending to latitudes 40° N and S (Gopal 1987).

Reproduction of water hyacinth is both sexual and asexual, with asexual reproduction being the most predominant (Center & Spencer 1981). However, sexual reproduction does occur and each flower can produce a large number of seeds that can remain viable up to 20 years (Gopal 1987). There are several sites in South Africa where seeds have been found in the substrate and several of these seeds are viable, with germination between 25 and 80 % (Albano Pérez et al. 2011).

Due to vegetative growth under suitable conditions water hyacinth populations can grow very quickly and in some cases double their biomass in as little as 11 to 18 days (Edwards & Musil 1975). As the nutrient concentrations (nitrogen and phosphorous) increase it has been shown that water hyacinth biomass also increases.

The species is known to cause major ecological and socio-economic impacts. According to Villamagna and Murphy (2010), these impacts include:

- Altering of water clarity and decrease in phytoplankton production, dissolved oxygen, nitrogen, phosphorous, heavy metals and concentrations of other contaminants;
- Decreasing abundance and diversity of aquatic invertebrates through decreased phytoplankton (food) availability;
- Decreased dissolved oxygen concentrations and decreased phytoplankton negatively impact fish species;
- Increasing of sedimentation rates within the plant's complex root structure; and
- Increased evapotranspiration rates from water hyacinth leaves when compared to evaporation rates from open water.

Further, invasive aquatic plants are known to disrupt navigation, fishing and other recreational activities, adversely affect waterflow, increase the loss of water from storage dams and pose a threat to hydro-electric installations. High densities of the plants degrade aquatic ecosystems and are a threat to biodiversity. They can also result in the deaths of cattle and livestock (due to walking on 'beds' of aquatic weeds which can result in drowning).

#### 2.8.2.2 Terrestrial Invasive Plant Species

Invasive alien plants are widely regarded as the single greatest threat to South Africa's biological diversity. The water taken up by alien plants affects not only the water supply, but can also have negative impacts on water quality.

Numerous terrestrial alien species occur along the Mthatha River (and Dam) including the red sesbania (*Sesbania punicia*), and lantana (Lantana camara). Black wattle (*Acacia mearnsii*), pines (Pinus spp.) and gum trees (*Eucalyptus* spp.) (River Health Programme, 2008). These species compete with indigenous vegetation for space, water, and nutrients. In addition, a large number of alien species occur in the 3128DA and 3128BC QDS surrounding the Dam. These include the following.

- *Acacia dealbata;*
- *Acacia decurrens;*
- *Acacia mearnsii;*
- *Acacia melanoxylon;*
- *Agave americana;*
- *Caesalpinia decapetala;*
- *Datura sp.;*
- *Eucalyptus sp.;*
- *Jacaranda mimosifolia;*
- *Lantana camara;*
- *Melia azedarach;*
- *Opuntia ficus-indica;*
- *Pinus sp. ;*

- *Populus nigra;*
- *Populus X canescens;*
- *Robinia pseudoacacia;*
- *Salix babylonica;*
- *Senna didymobotrya;*
- *Sesbania punicea; and*
- *Solanum mauritianum.*

This is an issue the management of the Dam as terrestrial invasive plant species are known to result:

- Loss of indigenous species as a result of competition for space and resources with alien species;
- Disruption of aquatic and riparian ecosystems;
- Erosion of river banks and riparian areas;
- Alterations in environmental flows as a result of water use by invasive alien plants; and
- An increased fire risk, which destroys indigenous habitats.

#### 2.8.2.3 Vegetation

Eastern Valley Bushveld is described by Mucina and Rutherford (2006) as being semideciduous savanna woodlands with pockets of thickets in a mosaic pattern. This may be succulent and dominated by *Euphorbia* and *Aloes*. Acocks (1953) called this vegetation type Valley bushveld whereas Low and Robelo (1996) called it Valley thicket. The tall shrub *Bauhinia natalensis* and the succulent herb *Huernia pendula* are endemic to this vegetation type

The conservation status of this vegetation type is Least Threatened. However of the National Conservation Target of 25% only 0.8 % is statutorily protected. Approximately 15% has been transformed through cultivation (Mucina and Rutherford, 2006). The main species occurring in the vegetation type are listed below.

- *Acacia brevispica;*
- *A. nilotica;*
- *A. tortillis;*
- *A. brevispica;*
- *A. natalitia;*
- *A. robusta;*
- *Achyranthes aspera;*
- *Aloe arboresecens;*
- *A. marlothii;*
- *A. rupestris;*
- *Aristida congesta;*
- *Berchemia zeyheri;*
- *Boscia albitrunca;*
- *Brachylaena ellyptica;*
- *Combretum molle;*
- *Cussonia spicata;*
- *Cymbopogon pospichilii;*
- *Dombeya rotundifolia;*
- *Euphorbia ingens;*
- *Euphorbia triangularis;*
- *Euphorbia grandicornis;*
- *Euphorbia tirucalli;*
- *Encephalartos villosus;*
- *Encephalartos natalensis;*
- *Eragrostis curvula;*
- *Eragrostis superba;*
- *Heteropogon contortus;*
- *Hibiscus pedunculatus;*
- *Hippobromus pauciflorus;*
- *Hyparrhenia hirta;*
- *Hypoestes aristata;*
- *Ischnolepis natalensis;*
- *Kleinia fulgens;*
- *Melinis repens;*
- *Panicum deustum;*
- *P. maximum;*
- *Peristrophe cernua;*
- *S. pyramidalus;*
- *Sanseveria hyacinthoides;*
- *Schotia brachypetala;*
- *Sclerocarya birrea;*
- *Spirostachys africana;*
- *Sporobolus fimbriatus;*
- *Themeda triandra;*
- *Tristachya leucothrix;*
- *Urochloa mosambicensis; and*
- *Ziziphus mucronata.*

### *2.8.3 Fauna*

#### 2.8.3.1 Fresh Water Fish

Exotic fish species threaten the existence of the indigenous fish species by altering the habitat competing for food, aggressively preying on indigenous fish and out-competing indigenous predators.

According to the River Health Programme (2008), several fish species in the Mthatha River are regarded as introduced alien species including rainbow trout *(Oncorhychus mykiss*) and smallmouth bass (*Micropterus dolomieu*) as well as the banded tilapia (*Tilapia sparmanii*), Mozambique tilapia (*Oreochromis mossambicus*) and sharptooth catfish (*Clarias gariepinus*) (which are indigenous to Southern Africa, but are not naturally found in the Mthatha River). The smallmouth bass was only sampled upstream of Mthatha Dam while the sharptooth catfish was only sampled downstream of the Dam.

However, this region has naturally low numbers of freshwater fish probably due to biogeographical factors and the evolutionary history of South Africa and thus the presence of invasive fish species in not likely to be the only cause of the low fish species diversity. The indigenous chubbyhead barb (*Barbus anoplus*) was noted downstream of the Dam but there is no evidence that occurs at the Dam itself.

Recent studies by Walter Sisulu University described in the Zoological Society of South Africa (ZSSA) Aardvark Newsletter (2013) found four species of fish at the Dam including *Tilapia sparmanii*, *Cyprinus carpio, Micropterus dolomieu* and *Orechromus mossambicus* . Mthatha Dam showed highest diversity of the Dams sampled in the area with *Tilapia sparmanii* being the most abundant.

Smallmouth Bass and Carp are also known invasive species listed in the NEMBA: Alien and Invasive Species Lists which were promulgated on 1 August 2014.

#### 2.8.3.2 Amphibians

The Eastern Cape Province has 61 described frog species. Fourteen species were found using the South African Frog Atlas Project (www.sarca.adu.org.za) in the QDS around the Dam (3128DA and 3128BC). However, recent surveys by the Walter Sisulu University (ZSSA, 2013) did not find any frogs at the Dam. Table 6 shows that the Vulnerable Natal Leaf Holding Frog occurs in the area.

*Table 6: Amphibians species occurring around Mthatha Dam*

| ***Genus*** | ***Species*** | **Common Name** |
|---|---|---|
| *Amietophrynus* | *gutturalis* | Guttural Toad |
| *Amietophrynus* | *rangeri* | Raucous Toad |
| *Afrixalus* | *spinifrons* | Natal Leaf-folding Frog |
| *Hyperolius* | *marmoratus* | Painted Reed Frog |
| *Kassina* | *senegalensis* | Bubbling Kassina |
| *Semnodactylus* | *wealii* | Rattling Frog |
| *Phrynobatrachus* | *natalensis* | Snoring Puddle Frog |
| *Xenopus* | *laevis* | Common Platanna |
| *Ptychadena* | *porosissima* | Striped Grass Frog |
| *Amietia* | *quecketti* | Drakensberg River Frog |
| *Cacosternum* | *boettgeri* | Common Caco |
| *Cacosternum* | *nanum* | Bronze Caco |
| *Strongylopus* | *fasciatus* | Striped Stream Frog |
| *Tomopterna* | *natalensis* | Natal Sand Frog |

#### 2.8.3.3 Reptiles

One hundred and sixty-four reptile species and subspecies have been recorded in the Eastern Cape Province. Of these, 5 are found around Mtata Dam (South African Reptile Assessment – www.vmus.adu.org.za ):

*Table 7: Reptile species occurring around Mthatha Dam*

| **Genus** | **Species** | **Common Name** |
|---|---|---|
| *Agama* | *atra* | Southern Rock Agama |
| *Cordylus* | *cordylus* | Cape Girdled Lizard |
| *Pseudocordylus* | *microlepidotus* | Cape Crag Lizard |
| *Hemachatus* | *haemachatus* | Rinkhals |
| *Afroedura* | *pondolia* | Pondo Flat Gecko |

#### 2.8.3.4 Mammals

The Eastern Cape Province has 86 described mammal taxa (species and subspecies). No mammal species however have been recorded in the 3128DA and 3128BC quarter degree grids which surrounds Mthatha Dam (www.vmus.adu.org.za) (ADU, 2012). This is indicative of the fact that the area around the Dam is not often visited because LNR is known to have blesbok, black and blue wildebeest, Burchell's zebra, fallow deer and various antelope that include the red hartebeest.

#### 2.8.3.5 Avifauna

The former Transkei region has a rich avifauna (Quickelberge 1989; Harrison et al. 1997), with nearly 500 species recorded from the region (approximately half of the species recorded from the subcontinent). They include numerous sensitive and threatened species. The coastal

mosaic of grassland and forest habitats serves as an important area for montane species in winter. Many Intra-African summer migrants also use the region both for breeding and in transit to more southerly areas.

A list of recorded bird species was obtained using the Avian Demography Unit MyBirdPatch database (www.mybirdpatch.adu.org.za) which includes data from the South African Bird Atlas Project 1 and 2 (ADU, 2013). An area around Mtata Dam was selected and a list of bird species occurring in this area was then generated. The list contains 260 bird species including a number of threatened species including Stanley's Bustard, Grey-crowned Crane, Cape Vulture and Martial Eagle.

Allan (ND) noted that the breeding population of Stanley's Bustard (*Neotis denhami*) found in the former Transvaal Province probably numbers less than 300 individuals (Tarboton *et al.* 1987) and that in the Eastern Cape Province the population has been estimated at 100-200 birds (Brooke 1984). The species is now rare or absent throughout most of the former Transkei region (now part of the Eastern Cape Province), although a small population, estimated at over 30 "pairs" (Butchart 1989), persists in the LNR). The species is listed as vulnerable and the main threats are habitat loss from overgrazing and frequent fires, collisions with powerlines, disturbance and hunting pressures (Barnes 2000).


*Figure 11: Stanley Bustard (@Eriwn and Peggy Bauer/Animals Animals, www.arkive.org)*

The Grey-crowned Crane is also of concern and is listed as vulnerable in the Eskom Red Data Book of Birds of South Africa, Lesotho and Swaziland (Barnes, 2000). The species prefers mixed wetland-grassland habitat and the South African population is estimated at 2 800-3 000 individuals.

Cape Vulture has also been noted in the area around the Dam. The former Transkei remains the stronghold of the species, which remains relatively common over the rugged terrain of the eastern Pondoland (Quickelberge 1989). Breeding colonies remain at the following areas:

- Confluence of Gcuwa and Bawa rivers, near Butterworth;
- Collywobbles on the Mbashe River (largest breeding colony, 400+ birds);
- Llower reaches of Mtamvuna River (Umtamvuna NR);
- Mlengana (Execution Rock), between Mthatha and Port St Johns; and
- Mtentu River, from Mkambati NR to 20km upstream.

The South African population is estimated at approximately 4 000 pairs (Barnes 2000). The main threat is high mortality caused by food shortages, poisoning, and electrocution and collision with powerlines (Markus 1972; Van Rooyen and Ledger 1999).

Martial Eagle has also been noted and has recently been uplisted to Vulnerable in the IUNC Red List as it is suspected to have undergone rapid declines during the past three generations (56 years) owing to deliberate and incidental poisoning, habitat loss, reduction in available prey, pollution and collisions with power lines (Birdlife International, 2013).


*Figure 12: Martial Eagle (@Kenneth W Fink/www.ardea.com, www.arkive.org)*

#### 2.8.3.6 Butterflies

A butterfly study has been undertaken at Nduli Nature Reserve which is on the outskirts on Mthatha and managed together with LNR and found 22 species of butterfly in the area including *Papilio demodocus*, *Borbo gemella*, *Precis Octavia*, and *Hypolimnas missipus* (Avuletey and Niba, 2014)

## 2.9 Climatic Conditions

The climate of the Mthatha catchment is warm to temperate, with rainfall occurring mostly in the summer in the form of heavy thunderstorms. Average rainfall varies according to altitude and topography, ranging from 1 000 to 1 300 mm per annum along the coast, to 700 mm per annum in the interior and up to 1 500 mm per annum along the escarpment. The mean daily temperature for Mthatha is 17.5 °C with a temperature range between 24.1 °C and the 10.9 °C (CSIR, 2008). The yearly rainfall for the town is 650 mm.

The Eastern Cape is considered to be one of the windiest parts of southern Africa. Mthatha is less windy than some areas in the province such as East London, with calms occurring 6% of the time. Winds blow predominantly from the ESE – SE sector at a speed of approximately 3.6 m/s (Figure 13).

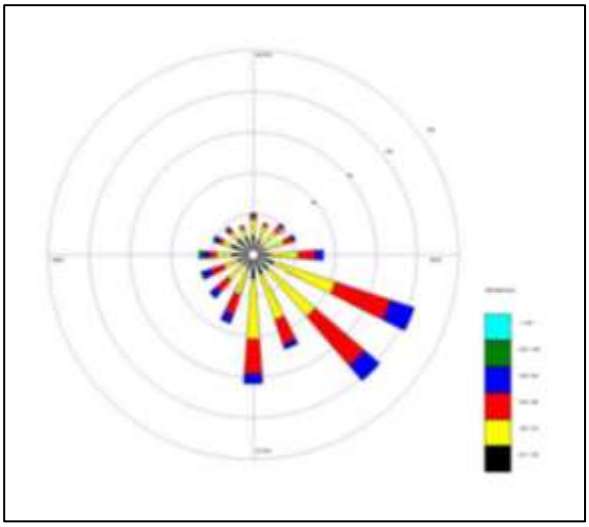

*Figure 13: Wind Rose for Mthatha (CSIR, 2008)*

The area is also occasionally affected by tornadoes (River Health Programme, 2008). De Coning and Adam (2000) found that there was extensive damage caused by the tornado which occurred on 15 December 1998 in Mthatha. This included the collapsing of a wall of a disused bus station, killing 11 people. Trees in the town's main street were uprooted, walls were blown down and roofs were torn off. Several buildings were badly damage, with some report stating that 1 500 buildings were damaged in a 70 km radius around Mthatha.

## 2.10 Heritage

The South African Heritage Resources Agency (SAHRA) has recently developed the South African Heritage Resources Information System (SAHRIS). As part of this, they have compiled a fossil sensitivity map for South Africa. The map provides an overview of estimated paleontological sensitivity of an area. The map below shows that the sensitivity of the area around Mthatha Dam is rated as very high (red) to moderate (green). Based on this a field assessment and protocol for finds is required or a desktop study (for the moderate sensitivity areas).

Almond et al. (2009) note that the Eastern Cape boasts a rich fossil record stretching back some 560 million years. The majority of the provincial

area is underlain by shallow marine, coastal and terrestrial sediments of Phanerozoic (*ie* post-Precambrian) age that are known to contain fossils of some sort, or are potentially fossiliferous. Among the palaeontological highlights of the Eastern Cape are:

- Diverse, high-latitude lacustrine to lagoonal biotas from the Late Devonian – Early Carboniferous Witteberg Group (c. 360-345 million years ago (MA)). These include a variety of fish and vascular plants as well as rarer arthropods;
- Fish, reptiles and therapsids ("mammal-like reptiles") from the Late Permian to Early Triassic Beaufort Group (c. 266-250 Ma);
- Rich fossil floras from the Late Triassic Molteno Formation (c. 220 Ma);
- A range of Early Cretaceous dinosaurs and plant fossils from the Kirkwood Formation (c. 135 Ma);
- Rich shelly marine faunas from the Early Cretaceous Sundays River Formation (c. 135 Ma); and
- Important coastal marine fossil biotas of the Algoa Group ranging from Eocene to Recent in age (50 to 0 Ma).

According to SAHRA's Archaeological Site Report, a number of Cultural Resource Management reports have been undertaken in the area but very few archaeological and cultural heritage resources have been reported. Resources reported include an ron Age circular stone structure (van Ryneveld 2010), a number of shelter sites of San and Khoe ancestry as well as Xhosa ancestral graves (Van Schalkwyk 2008), giving the impression of a culturally varied archaeological record in the region.

Mthatha (then called Umtata) developed as a Colonial Period settlement in the 1870's, primarily as response to tensions between the Pondo and neighboring Xhosa groups (Van Rynveld, 2013). In 1875 a Magistrates office opened and in 1882, the town became a military post for British forces. The town itself was founded in 1883, situated along the banks of the Mthatha River and soon grew into a leading administrative area, housing both Anglican and Catholic cathedrals. It also became the seat of traditional authorities and a parliament building for this purpose, the *Bunga*, was constructed. From 1976 to 1994, it served as the capital of the *Transkei Bantustan*. Umtata was officially renamed Mthatha in 2004 (Van Rynveld, 2013).

Many a prominent black Struggle leader came from this area, including amongst others, Walter Sisulu, Bantu Holomisa and Nelson Mandela, with *Madiba's* home village Qunu being situated about 50km from the Dam.

## 2.11 Current Institutional Arrangement

### *2.11.1 Official Institutional Structure*

DWS is the official custodian of all surface water in South Africa in terms of the National Water Act, 1998. However, no landownership information was available however it is understood that the Dam and shoreline occurs on traditional land which was not purchased or expropriated by the Department when the Dam was built. During public participation, it was also noted that the community had not been compensated for the loss of the land.

### *2.11.2 Informal Institutional Structure*

There is no specific informal structure in place however there does appear to be some confusion regarding roles and responsibilities. Most community members get permission to use the Dam from the KSDLM rather than DWS. There was also an irrigation project which was apparently approved by the Municipality not DWS.

### *2.11.3 Management of the Water Surface*

DWS is responsible for the management of the surface water. In terms of AtoN and demarcation markers, initial payment for the AtoN and demarcation markers (for general navigation) will be undertaken by DWS. However, the provision and maintenance of the demarcation markers at LNR (if required) will be for the cost of the latter.

#### *2.11.4 Access*

There is no formal access area at the Dam however the local community does make use of the Dam for picnics, fishing and swimming. Most of the Dam is not fenced and therefore the community can access the Dam at multiple points.

There is very little access control at the Dam and illegal abstraction does occur.

The DEA, EC-DEDEAT, KSDLM and ECPTA have developed a conference facility and sunset restaurant at LNR on the shoreline of the Dam. There is no slipway in place at this point.

DWS has offices at the Dam. They are also responsible for the management of the main Dam infrastructure which includes the Spillway. There is no formal slipway as boats can be launched directly from the shore.

In terms of the surrounding communities, the Dam has formed a barrier that acts to isolate the communities as it makes access between communities difficult. The only access between the Rosedale side of the Dam and the DWS side of the Dam is the old bridge.

#### *2.11.5 Permits*

A Freshwater Angling License is required from EC-DEDET for freshwater angling in the Eastern Cape. No specific angling licenses are required for fishing at the Dam.

#### *2.11.6 Safety*

There is no overall safety system in place at the Dam. As mentioned above, there have been a number of drownings caused by people trying to swim across the Dam. During consultation, the community did not seem to be aware of the dangers of the spillway and there have also been occurrences of children drowning while playing in the Dam. The spillway is also not completely fenced off and a number of accidents have happened at the spillway.

#### *2.11.7 Overnight facilities*

Currently there are no overnight recreational facilities in place although they are planned as part of the future development of LNR.

#### *2.11.8 Event Management*

No formal recreational events take place at the Dam. According to information provided by the local community during public participation, the Rosedale community is organizing a heritage day celebration at the Dam including canoe demonstration.

## 2.12 Users and Uses of Mthatha Dam

#### *2.12.1 Current and Future Domestic Use*

The main function of Mthatha Dam is to supply water to the city of Mthatha and associated peri-urban areas however according to DWA (2013), only 19 million $m^3$ of the 228 million $m^3$ capacity currently provides water for domestic purposes. According to the National Water Resources Strategy (DWA, 2013), the Dam has unallocated capacity but due to exceptionally high losses of water (50%) in the water distribution system supplying the town of Mthatha and the peri-urban areas (KSDLM), DWS is not considering increasing the allocation at this point.

However, according to the Amatola Water Annual Report (Amatola Water, 2013), as part of the KSDLM Presidential Intervention, Amatola Water signed an Implementing Agent Agreement with the ORTDM on 31st October 2012. As part of its advisory services, Amatola Water has based the design of the water supply to be anchored on the existing Mthatha Dam which is currently under-utilised and has an existing licensed allocation of 150 million $m^3$ to ORTDM. This approach, designed at the 750 litres per household per day standard, will enable the ORTDM to make a significant improvement in community by providing water to 999 Villages which currently have no formal services at all will be supplied using the higher standard to villages, 1057 Villages which currently have some level of service, but not

consistently at RDP standards will be supplied; and 85 villages which currently have services at the minimum standard and these will be further improved.

Moreover, there are no fences around the Dam and thus the Dam is an important source of water for cattle. Although most of the adjacent community has access to piped water, there are often shortages and issues with supply. The Dam therefore often provides water for domestic purposes including drinking and washing of clothes.

#### *2.12.2 Electricity Generation*

In 1980 the former Transkei government financed the development of Hydro power schemes in the Eastern Cape including First and Second Falls on the Mthatha River. The schemes initially provided electricity to the Transkei Electricity Supply Corporation but where handed over to Eskom Southern Region in April 1995 (Boltt, 2013).

First Falls is located approximately 5km east of Mthatha and has two 3MW units with the provision for a future third machine. Water is discharged at 6m$^3$/sec from Mthatha dam down the river to First Falls. The capacity of First Falls is 6MV (Gaunt, 2005).

Water released from first falls then travels to Second Falls which is located about 15km downstream from First Falls (Boltt, 2013). The station has two 5.5MW units with the provision for a future third machine and water consumed on full load is 25m$^3$/sec. The Station was totally refurbished in 2000 and has a capacity of 11MV (Gaunt, 2005).

According to DWA (2013), most of the water from the Mhtatha Dam (85 million m$^3$/a) is currently being used to power Eskom's First and Second Falls hydroelectric schemes.

#### *2.12.3 Recreational Use*

The Dam is used informally for recreation by the adjacent communities and the most common activities include:

- Swimming;
- Picnicking; and
- Subsistence Fishing.

Occasionally the Dam is also used by tourists to the area and local websites note that fishing from boats, skiing and canoeing are popular activities. However, formally, the Dam is not open for recreation. There are also no recreational clubs based at the Dam.

#### *2.12.4 Cultural Use*

The Dam is also used for a number of traditional ceremonies by the adjacent communities.

#### *2.12.5 Subsistence Fishing*

The community around the Dam use the Dam for subsistence fishing using rods. Most community members do not have access to boats and no gill net fishing is thought to occur.

#### *2.12.6 Conservation*

The Dam is located next to LNR which is home a variety of wildlife and a series of wetlands and grasslands that support a wide selection of birds, including the Stanley's bustard. DEA in partnership with EC-DEDEAT, ECPTA and KSDLM have developed a conference facility, restaurant and sunset bar in LNR on the banks of Mthatha Dam.

The extent of LNR was not available as there seems to be discrepancies between the Nature Reserve boundary provided as part of the Mthatha Dam Master Plan and the LNR boundary included as part of SANBI's protected areas GIS. In addition, LNR does not appear to be a proclaimed Nature Reserve although the near by Nduli Nature Reserve (which is managed together with the LNR) was re-proclaimed in 1972.

### 2.13 Catchment Interactions

Based on the status quo of Mthatha Dam, it is clear that there are a number of factors that influence the ecological status, the use and management of the Dam.

- Land use in the catchment, especially Forestry and Agricultural use has impact on the water quality of the Dam. This is further impacted by Wastewater Treatment Works (WWTWs) in the catchment which are sources of pollution;
- Lack of sanitation services results in increased eutrophication of the Dam and can result in algal blooms and aquatic invasive plants;
- Overgrazing and poor land management result in dongas and increase the turbidity of the Dam;
- A lack of fencing around the Dam makes allows for easy community access however may be a safety risk as there is no access control. It also allows direct access to cattle which may negatively impact water quality;
- The Dam is located between a number of communities and has resulted in a level of isolation. Community members often try swim across the Dam or have to use the old bridge which is a safety risk;
- The Dam is located on traditional land and there is no DWS purchase boundary and therefore no integrated shoreline management in place;
- Poor roads and a lack of road signs negatively impact tourism at the Dam;
- The Spillway is a safety risk and may limit recreational use at the Dam;
- The Dam occurs within the LNR and there is a current partnership between DEA, EC-DEDEAT, KSDLM and ECPTA which has resulted in the construction of a conference facility and restaurant;
- The Dam is located in close proximity to Mthatha Airport and is positioned such that it could act as a gateway to areas such as the Wild Coast.
- The Dam is located near Mthatha, Qunu, Mvevo and thus has linkages to important historical areas;
- The avifauna and butterfly biodiversity provide an opportunity for conservation and education;
- Potential for Algal blooms and the hyper-eutrophic state are potential threats to recreational use;
- Important paleontological, archaeological and historical heritage resources in the area around the Dam provide an opportunity for heritage conservation as well as heritage based tourism and education;

It is important to understand how the Dam is influenced by these factors so that management of the Dam through the RMP are taken into account.

# 3 WHERE DO WE WANT TO BE?

## 3.1 Vision

A visioning exercise was carried out with a combination of stakeholder input from public meetings, authorities meetings and one on one stakeholder meetings.

This Vision for Mthatha Dam is highlighted through the unpacking of the needs, interests, requirements and uses of the Dam.

Stakeholders showed a strong focus on using the Dam as an economic lever for development and job creation. The potential for community irrigation projects was also noted. Creating partnerships with various stakeholders including the community was seen as important as was the need for improved water quality, improved access between disparate communities, improved services and community development and skills training. Clear roles and responsibilities and institutional arrangements are also key as all other objectives require a management system in place. Development of water sports and recreational use was also seen as highlighted however improved safety is required to realise this.

The Vision statement that encompasses this is:

*"Mthatha Dam: A tourism destination that supports sustainable and safe development which creates opportunities for our community."*

## 3.2 Objectives

Based on the SWOT analysis as well as the Uses, Needs, Interests and Requirements, a number of objectives were identified. These are listed below together with some of the requirements needed to meet these objectives.

**Improved management, safety and communication**

- Formalised institutional structure;
- Improved access control to the Dam to prevent illegal abstraction;
- Assessment of spillway buffer to be undertaken to determine what buffer is required. The assessment should also assess what activities can take place at the Dam without compromising the spillway;
- Spillway to be fenced off to prevent access and ensure community safety;
- Survey of the Shoreline boundary and determination of the full supply line and buffer. Once the shoreline has been resolved, a shoreline zonal plan should be compiled in line with the RMP;
- Land matters to be resolved including discussions with the surrounding communities and compensation for land where necessary;
- Legalise agricultural development around the Dam;
- Agreements with government stakeholders such as ECPTA, DEA and KSDLM taking into account RMP;
- Unique Positioning Number (UPN) System to be implemented and extended to local communities;
- Flood warning system to be developed to ensure downstream communities are warned of floods; and
- Standardised AtoN and demarcation markers to be implemented.

**Increased, safe and equitable access and use for recreation**

- Public access picnic areas to be created on both the DWS and Rosedale side of the Dam;
- Coordination with SwimSA to create a swimming school at the Dam;
- Zonal plan to take into account different recreational activities. Further, the shoreline zonal plan should be updated once the extent of the purchase boundary of the Dam is known; and

- Discussions with South African Sports Confederation and Olympic Committee (SASCOC) and other national associations regarding the potential for the Dam to be used as a venue for national and or provincial competitions. This would also include the development of various water sports in the surrounding communities through partnerships with clubs based at different Dams or through new clubs established at the Dam.

**Community beneficiation through the creation of a sustainable economy based on the development of Mthatha Dam**

- Integrated tourism plan to be developed. This should include potential for recreational clubs, marketing strategies, linkages to Mthatha airport, improved roads and signage;
- The potential for community agriculture programmes with irrigation to be determined. These community programmes could provide food for tourism ventures in the area;
- Potential for water troughs for watering of cattle;
- The potential for a small-scale fisheries project for the local community to be determined. This would include training, provision of boats and nets etc.;
- DWS to partner with ECPTA, EC-DEDEAT, DEA and KSDLM in order to enable improved tourism at the Dam including PPPs for accommodation, boat cruises, management of public access areas etc. ;
- Potential feasibility of a Butterfly Park to be assessed;
- Development of community craft market linked to cultural village at the Dam;
- Potential for the creation of a Water sports stadium at the Dam to be determined; and
- Development of micro-enterprises and entrepreneurs. This could be linked to tourist initiatives in the area including cultural village and craft market, Nature Reserve, Nelson Mandela (i.e. walk in the footsteps of Mandela, links to Qunu) , Wild Coast Transkei, etc.

**Improved water quality and properly managed natural resources**

- Discussions with the National Land Care programme to ensure eroded areas around the Dam are rehabilitated;
- Biodiversity studies including, flora, fauna, avifauna, fish etc. to understand the natural resources around the Dam and in the nature reserve. The information from these studies can be used to ensure sustainable development and for marketing of the Dam;
- LNR to be proclaimed as a provincial nature reserve;
- Implementation of a wash bay to prevent Invasive Aquatic Plants;
- Survey of the Dam to identify any Invasive Aquatic Plants and if necessary control and management of Invasive Aquatic Plants;
- Pollution point study to be undertaken to identify main sources of pollution at the Dam;
- Upgrade of the Elangeni WWTWs;
- Water quality monitoring to be linked to the UPN System to allow quick response;
- DWS Water Quality Monitoring Department to ensure relevant personal undergo skippers license training and water quality monitoring to be undertaken from various points around the Dam;
- Shoreline management plan to be compiled and implemented in conjunction with the community and stakeholders such as DEA, ECPTA, KSDLM and EC-DEDEAT. This plan should have a strong focus on erosion and silt management as well as management of grazing and should be developed in conjunction with DAFF. This plan should also provide guidance on acceptable areas for activities such as quad biking;

- Education programmes regarding the impacts of alien invasive species to be instituted;
- Paleontological and archaeological heritage resources study to be undertaken;
- Population assessment of Stanley Bustard; and
- Sustainable fishing plan for invasive species to be compiled in line with the National Environmental Management: Biodiversity Act (NEMBA).

**Improved access and services**

- The potential feasibility for a ferry system to link communities on either side of the Dam to be determined. The study should assess safety, potential locations and linkages to existing roads. Discussions with KSDLM should also take place;
- The potential feasibility for the relocation of the bridge to be determined; and
- The upgrade of the Rosedale Water Purification Plant to improve water supply to communities.

**Community skills development, awareness and training**

- Lifeguard skills training and first aid training to ensure safe public use of the Dam;
- An Education programme to be developed by the Department of Health regarding safe use of raw water for domestic purposes;
- Awareness campaign to be developed by the DMC. The campaign should focus on potential uses of the Dam, the importance of infrastructure (to ensure no vandalism), Dam safety and the Dangers of swimming across the Dam; and
- Discussions between local schools and universities regarding the potential for using the Dam as part of education programmes.

# 4 HOW DO WE GET THERE?

## 4.1 How does the RMP Work?

The overarching framework for the Mthatha Dam RMP is presented in Figure 14 below. It highlights the consultative nature of the RMP process where stakeholder meetings, public meetings and authority meetings were used to identify the Vision and Objectives for the Dam. The Vision and Objective forms the central tenet around which the RMP is based. The RMP is further broken down into 4 main Plans namely, the Institutional Plan, Financial Plan, Strategic Plan and Zonal Plan.

Each of the major areas of the RMP will be presented in detail further in this chapter. Briefly: The **Institutional Plan** provides a framework for the institutional arrangements at the Dam. In this case a three-tiered management system is proposed. This three-tiered approach includes a RMP Steering Committee (RSC), Operations Management Committee (OMC) and Dam Management Committee (DMC). Further, it should be noted that DWS reserves the right to appoint an Implementing Agent (IA) at the Dam. This IA would then form part of the institutional structure.

The RSC includes representatives of National Government Departments and fulfils a monitoring and high level guidance function to ensure that all functions of the DMC and OMC are being undertaken.

The OMC will be formed at an Operations or Cluster Level and is a current reporting line within DWS. The DMC will include authorised access point representatives and those who have an official mandate at the Dam. All three committees are chaired by a DWS official or IA should one be appointed.

The Institutional Plan discusses requirements for agreements, development targets (in relation to community development of water sports) and information on the affiliations required. The detailed Institutional Plan is provided in the **Chapter 4.2.**

The **Financial Plan** provides information on how money generated through recreational use should be used, by whom and for what. It also provides guidelines on the financial reporting required. Further, the information from the Financial Plan is used to inform the Business Plan. The detailed Financial Plan is provided in **Chapter 4.3.**

The **Zonal Plan** has three main components:

- Shoreline Management Zones;
- Water Surface Management Zones; and
- Activities allowed in each zone.

The activities are presented in Table 9 and provide information on activities that currently allowed as well as potential activities. The detailed Zonal Plan is provided in **Chapter 4.4.**

In terms of the **Strategic Plan**, the vision for the Dam was distilled into a number of objectives. These objectives are further distilled into actions required in order to achieve the Vision. This information was used to inform the BP for each objective. The detailed Strategic Plan is provided in **Chapter 4.5.**

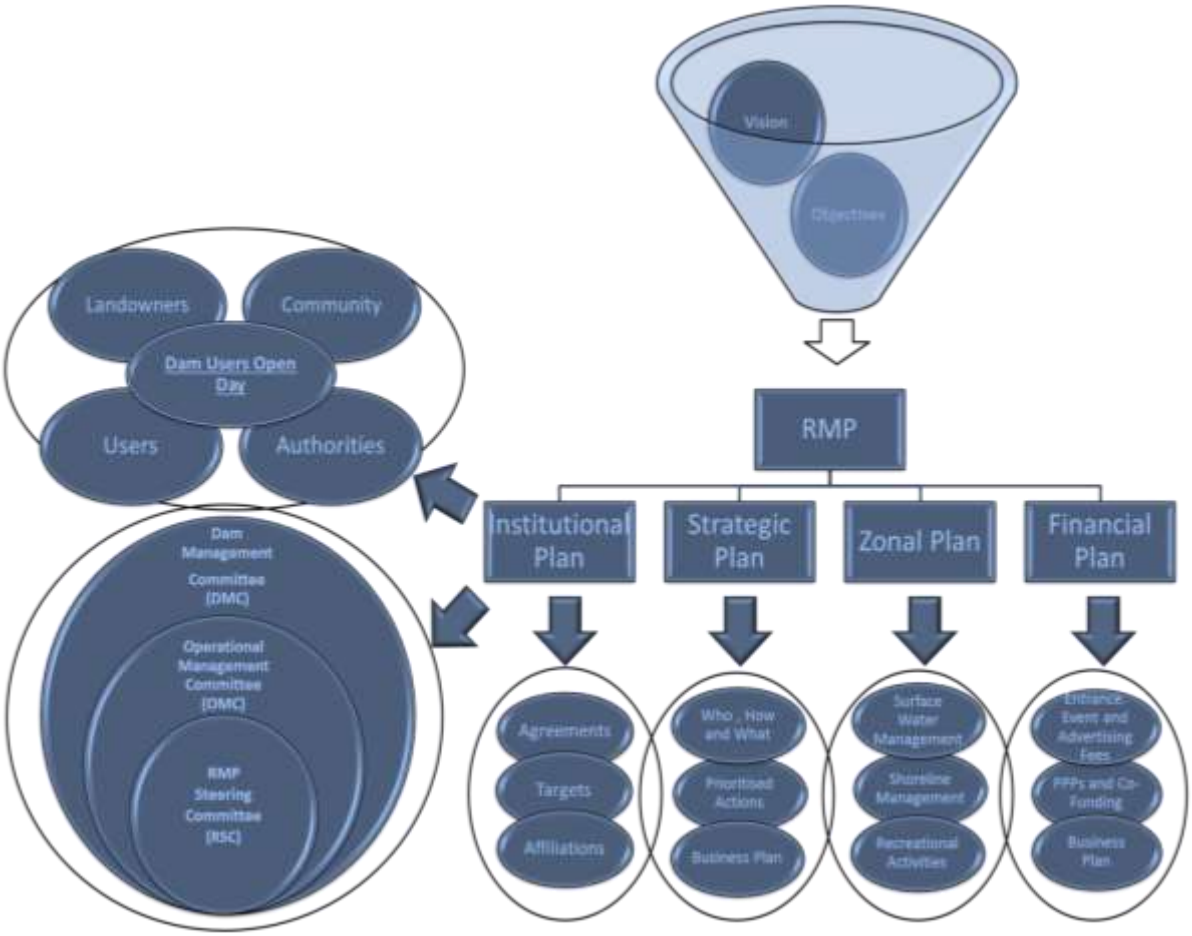


*Figure 14: RMP Framework*

## 4.2 Institutional Plan

The Institutional Plan is the backbone of the RMP as it identifies the management system which is required to ensure the objectives of the RMP are met. The Institutional Plan consists of three sets of tools which will be used to manage the Dam so that the Vision can be met.

The first toolset involves three separate but interlined committees all Chaired by the DWS because DWS is the custodian of all surface water in South Africa.

The membership of each committee and their roles and responsibilities is provided in Section 4.2.1., 4.2.2. and 4.2.3. below.

The second toolset involves an open communication forum which allows all stakeholders to be involved in the management of the Dam. The purpose of this forum is to share information and allow stakeholders to raise concerns and ideas regarding the management of the Dam. It also provides a platform for dealing with issues and challenges faced by users.

The third toolset includes a number of management tools including agreements, affiliations and targets. Figure 15 below provides a visual representation of how these toolsets function together.

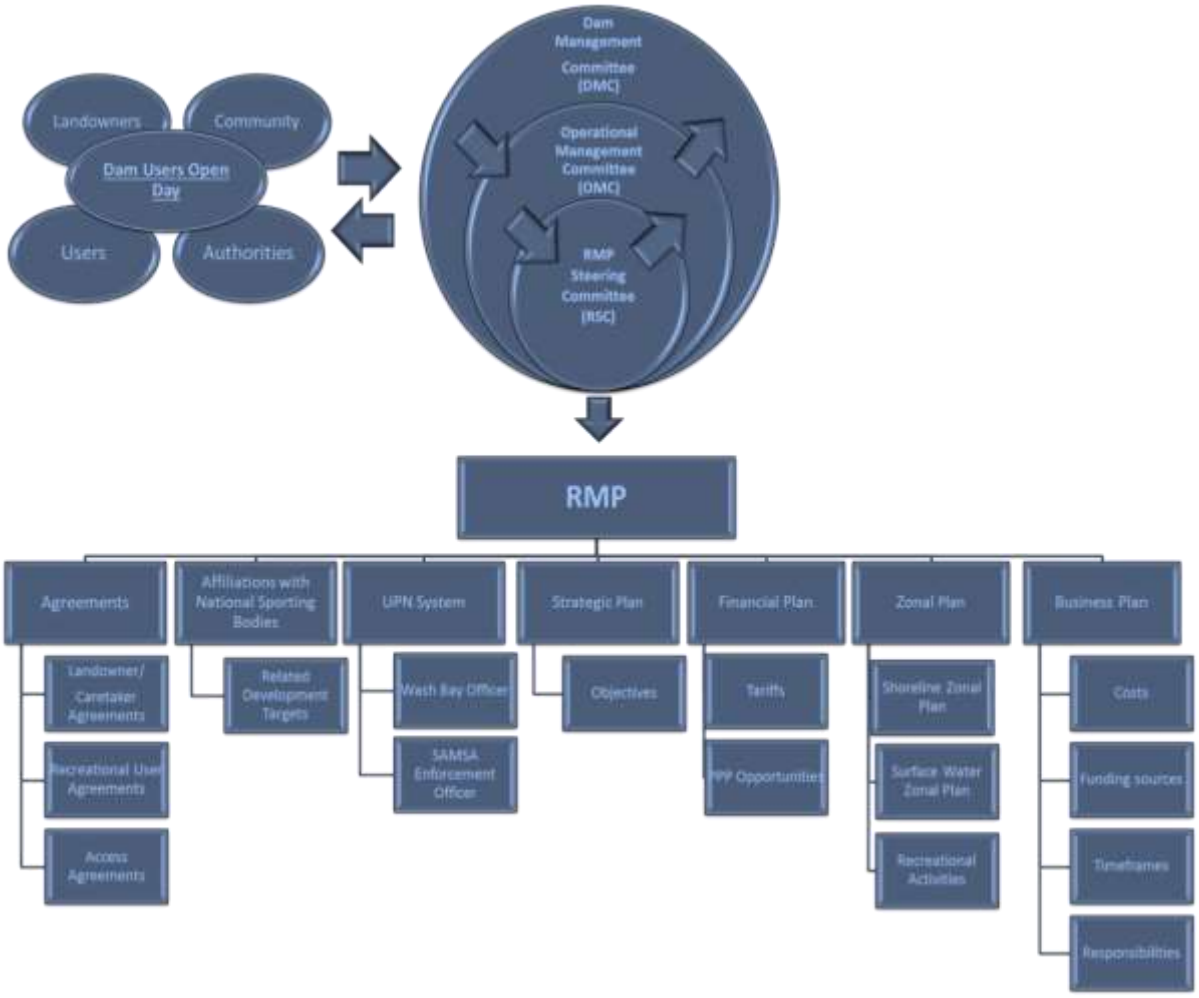


*Figure 15: Institutional Framework*

### *4.2.1 RMP Steering Committee (RSC)*

The RSC is made up of representatives from National Government/Agencies. The main focus of this meeting is to ensure both the DMC and OMC are performing all necessary functions. The committee will also provide high level guidance. The RSC allows for a formal reporting structure between the Chief Director: Operations and the National Water Infrastructure Branch: Integrated Environmental Engineering (NWRI:IEE). Relevant departments from DWS including Operations, Water Quality Management and Catchment Management will be included in the RSC. The committee will meet every six months. Figure 16 below provides details of the membership of the RSC.

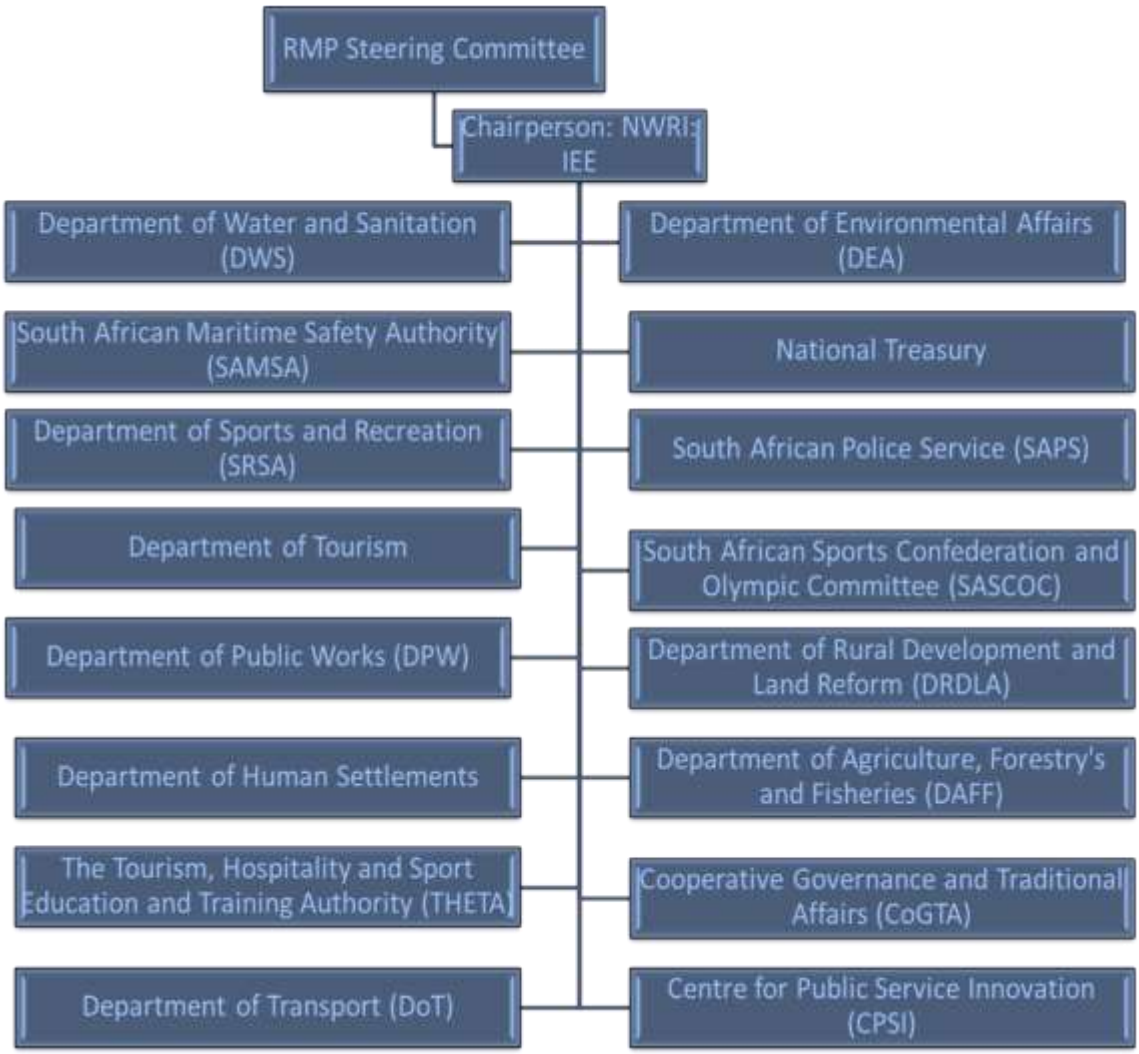


*Figure 16: RSC Membership*

### *4.2.2 Operations Management Committee (OMC)*

The OMC will function at a catchment level and will provide high level guidance for all Dams occurring within one catchment. This is an existing reporting line between Area Managers for various schemes, the Regional Manager and the Director: Operations. The implementation of the RMP will be added as an agenda item, hence providing an opportunity to discuss the RMP. The Regional Manager will be fully aware of all commercial and/or recreational activities/opportunities at all Dams within the cluster.

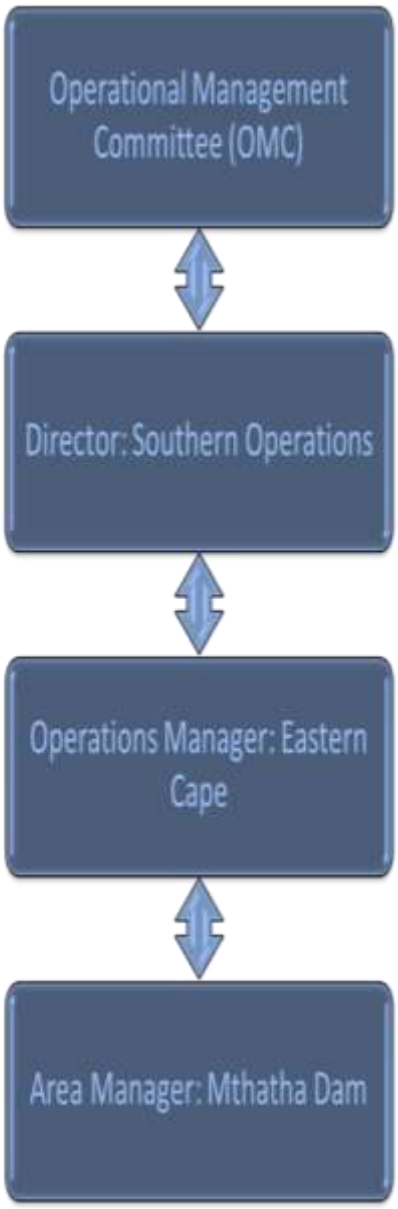


*Figure 17: OMC Membership*

### *4.2.3 Dam Management Committee (DMC)*

The DMC is responsible for operationalisation of the RMP and includes a larger pool of representatives. This committee is chaired by the delegated DWS Official.

The DMC is involved in the management of the UPN System as part of the CIWSP and includes the following representatives:

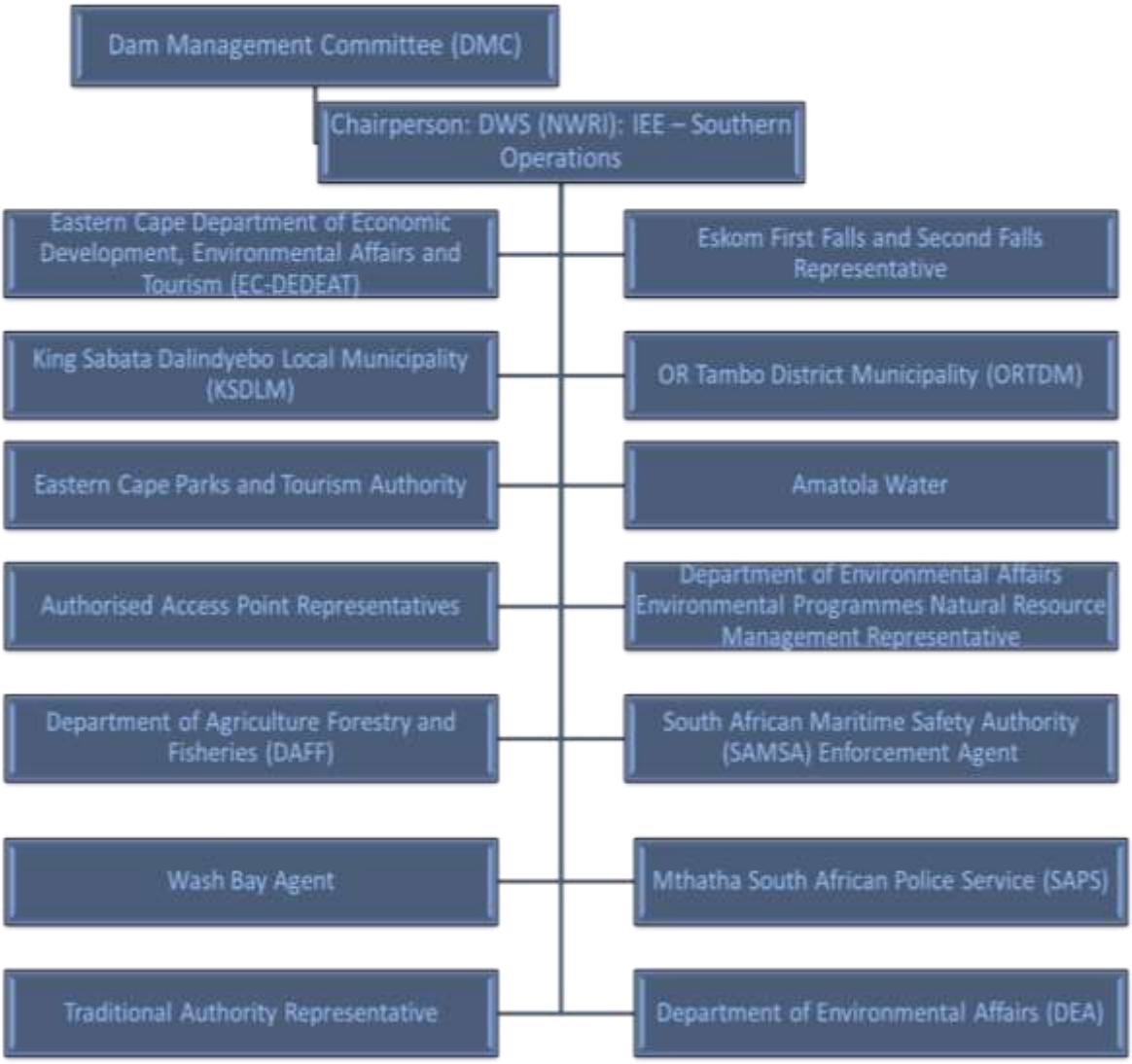


*Figure 18: DMC Membership*

One of the main functions of the DMC is to assess commercial opportunities at the Dam. As such, an agenda item related to the Strategic Plan for Commercialisation (SPC) is required. In addition, changes in water quality, developments in the area, status of Aquatic Invasive Species and education and information programmes should be discussed. The DMC should meet every three months (i.e. quarterly).

Another important function of the DMC is to organise and facilitate the quarterly Dam User

Open Day. All stakeholders should be invited to this meeting so that issues regarding use of the Dam can be discussed. If necessary, serious issues can be escalated from the Public Open Day to the OMC and then RSC so to ensure swift conflict resolution. The Open Day also provides an opportunity for the DMC to inform users of the Dam of all rules and regulations governing the access and use of the Dam.

Operational management of recreational activities such as ensuring the AtoN and demarcation markers system is in place and setting times for use of the Dam (within the current framework of GN 654 of 1964) will also be managed by the DMC.

The final structure of the DMC may change once agreements with Authorised Access Points Representatives are concluded. The updated DMC membership list will be added as an addendum of the Gazetted RMP.

Lastly, the DMC is also responsible for ensuring the BP is implemented.

### *4.2.4 Management tools*

The RSC, OMC and DMC will have a number of management tools which will enable proper management of the Dam in line with Legislative requirements.

#### 4.2.4.1 Terms of Reference

The RSC, and DMC will be guided by Terms of Reference (ToR) regarding roles and responsibilities. The ToR will provide guidance on the following management aspects:

- Meeting frequency;
- Roles and Responsibility of Chairperson;
- Roles and Responsibilities of Members;
- Minutes and attendance requirements;
- Reporting requirements;
- Management of agreements;
- Management of access objectives;
- Management of development targets;
- SPC;
- Management of Water quality monitoring;
- Management of the Control of Aquatic Invasive Species;
- Management of Development Pressure; and
- Management of UPN system and wash bays.

Terms of Reference are not required for the OMC as this is an existing reporting structure.

#### 4.2.4.2 Agreements

1.) Agreements between DWS and Implementing Agent

One of the main management tools available is the use of agreements to ensure proper use of the Dam in line with the RMP vision and objectives.

However at this point, DWS does not own the land beneath the surface water or a purchase boundary around the high water mark. It is thus suggested that DWS undertakes discussions with the Traditional Authority to purchase the land. Once the land ownership has been resolved, it is suggested that DWS meet with EC-DEDEAT to discuss the potential of delegating management of the surface water and the shoreline to EC-DEDEAT as part of LNR. EC-DEDEAT would then be in a position to make use of the surface water opportunities through a public operator. EC-DEDEAT, ECPTA, DEA and KSDLM in partnership have already constructed a conference facility, restaurant and sunset bar and plan for these facilities to be managed though a PPP. It would thus be possible for the PPP to be extended and/or additional PPPs be undertaken for public facilities and surface water activities.

The agreement would include management of all recreational use at the Dam including:

- Management of Recreational Clubs;
- Management of Public Access Area;
- Management of Wash Bay and UPN System;
- Management of Community Skills and Training Programmes; and
- Management of commercial activities (in line with Treasury Requirements).

All agreements should be in line with the RMP requirements which as a minimum must achieve the following:

- Conditions on IA's mandate to enter into agreements with other parties on the use of the surface water for recreational use;
- Terms and conditions regarding equitable access must be included in ALL agreements;
- Guidance on the use of the State Resource for PPP in line with Treasury's requirements;
- Safety management to be in line with SAMSA requirements;
- Targets and objectives for the management of the Dam;
- Roles and responsibilities regarding the following:
    - Maintenance of AtoN and Demarcation Markers;
    - Maintenance of Wash Bays;
    - Maintenance of Recreational Infrastructure;
    - Maintenance of Fencing;
    - Maintenance of the UPN System including signage;
    - Management of agreements with other recreational users;
    - Responsibilities on monitoring development and access targets (as part of agreements with other recreational users).
    - Conditions on the use of the Dam for small scale fisheries or for commercial fisheries projects; and
    - Conditions for the negotiations of agreements with recreational clubs. As a minimum, it is suggested that all agreements between the IA and any recreational clubs, should be reviewed and accepted in writing by DWS. They should also be presented to the DMC prior to signature to ensure the vision and objectives of the RMP are met.

Irrespective of the nature of the agreement the following must be incorporated:

- Clear start and end dates and terms of renewal/extension;
- Rights and obligations of both parties;
- Access points to be used must be stipulated. There are no formal access points currently in place. The RMP has suggested three potential access points.) Access agreements with DWS will be necessary within the next year. Failure to do so will result in unauthorized access points being closed (see section on Access agreements for more details);
- IA's (and therefore DWS's) exclusion of liability;
- Terms and conditions of improvements made to the property should be stipulated. All improvements require consent from DWS and the DMC. Furthermore, the financial consequences should this requirement not be met should also be stipulated in the agreement. No permanent structures shall be built within the 1:100 year floodline without additional approval as required by Section 21 I and (i) of the National Water Act, 1998 (Act no 36 of 1998);
- The extent of the rights to use the resource should be stipulated;
- Clear instructions on the financial requirements of both parties, and where and when money must be paid should also be stipulated. All recreational clubs and societies on State Land must be managed in line with National Treasury requirements. Lease agreements for use of State Land should include fair remuneration at the current market value;
- All agreements should include a cancellation clause if requirements cannot be met;
- All clubs or associations must be affiliated to a national sporting body recognised by the South African Sports Confederation and Olympic Committee (SASCOC)

- All agreements must include a cancellation clause if clubs or associations fail to obtain affiliation within one year from date of signature of the agreement;
- Limitations of the number of people allowed to access the water surface of the Dam based on carrying capacity of Dam as well as the carrying capacity of the CIWSP wash-bays must be adhered to;
- A list of current and potential recreational activities allowed at the Dam;
- Requirements for safety, disaster management and emergency response plans;
- Duties and responsibilities of either party regarding maintenance, management and infrastructure;
- A list of prohibited activities;
- Requirements for subletting portions of the leased area (if allowed);
- Conditions on the use of the Dam for small-scale fisheries projects;
- A mandate for programmes to assist in equitable access and redressing past imbalances at the Dam, such as sponsored gate-fees for members of previously disadvantaged communities. This should be in line with the RMP. The DMC will then be required to report against all targets at the OMC;
- All agreements must include a cancellation clause should community access targets not be met; and
- All recreational activities must be in line with the RMP, which once gazetted, becomes the mechanism to control and manage recreational use. Although no Section 21k Water Use License Application (WULA) is required, all activities must comply with all other relevant legislation requirements including the following:
    - The Merchant Shipping (National Small Vessel Safety) Regulations, 2007, - Control of Boating;
    - Section 21 (a) of the National Water Act, 1998 – abstraction;
    - Section 21 I and (i) of the National Water Act, 1998 – construction of slipways/infrastructure;
    - Safety at Sports and Recreational Events Act, 2010 – Events; and
    - Provincial Ordinances – Fishing.

These agreements should be updated within the next year.

2.) Recreational Use Agreements

Any new recreational Clubs must enter into an agreement with the IA who will be responsible for the surface water management of the Dam. All recreational use at the Dam must be through an appropriate legal framework. However, all agreements must be approved in writing by DWS and the DMC.

Recreational Use Agreements must be developed in line with the conditions stipulated in the agreement between DWS and the IA.

All agreements must be finalised within one year of the RMP being gazetted.

3.) Land Management Agreements

The DMC should actively consider land management strategies that improve the efficiency of current practices. This could include co-management agreements with surrounding or adjacent landowners which may result in environmentally sustainable and more efficient land management.

Agreements must be developed with appropriate legal advice and consultation.

In the case of Mthatha Dam, there is no DWS owned purchase boundary in place at this time. It is suggested that land ownership be resolved and shoreline management be in line with the Shoreline Management Plan to be developed as part of the BP for the Dam. Shoreline Management would be undertaken as part of the agreement with the IA as discussed above.

All agreements should be should be put in place within one year of the RMP being 57azette.

4.) Access Agreements

All surface water access must be formalised. The conditions for such access must be written into the agreement. All illegal practices must be addressed. Appropriate action must be taken to ensure that all parties comply with the requirements of the RMP.

All community members, adjacent landowners and clubs must be made aware that access to the surface water should only be through authorised access points. Accessing the surface water through unauthorised access points is an illegal activity unless they enter into a formal agreement with DWS.

Further, a formal agreement with DWS will be required by all community members, adjacent landowners and new recreational clubs that have direct access to the water surface of the Dam through 1.) constructed slipways; 2.) natural slipways; or 3.) jetties for angling and/or launching of boats. Additional agreements with the IA may also be necessary.

The wash bay must be built on State Property as part of the CIWSP. A formal agreement is necessary between the IA and DEA on the management and maintenance of the facility. The agreement will be overseen by the DMC.

All agreements should be put in place within one year of the RMP being 57azette.

5.) Safety of Navigation Agreements

Agreements between SAMSA and DWS/other relevant Parties/Bodies are to be concluded to allow them to:

- Exhibit the relevant AtoN; and
- Establish or deploy the relevant fixed and/or floating AtoN.

6.) Event Applications

At this point, Mthatha Dam is not used for formal events. An intervention is included in the BP to increase the use of the Dam by recreational clubs. However should this be the case, all events must be managed through an event application process. While the application may be made to the IA, DWS and the DMC must approve the application. These applications must follow a specific template and will include the following:

- Number of participants;
- Emergency Response Plan;
- Advertising and branding (will need to be in line with DWS communication requirements);
- Access points to be used;
- Costs; and
- Films/photographs that will be generated to be in line with DWS communication requirements.

Further, all Events must meet the requirements of the Safety at Sports and Recreation Act, 2010 (Act No 2 of 2010).

#### 4.2.4.3 National Affiliations and Development Targets

All recreational clubs should be affiliated to a SASCOC affiliated organisation. The development targets set by the National Organisations must be met. The Clubs must be affiliated within two years of the RMP coming into effect.

#### 4.2.4.4 Community Participation and Beneficiation

The RMP has suggested a number of different objectives, actions, interventions, agreements and institutional arrangements to ensure that community participation and beneficiation of the resource takes place. These are captured throughout the different plans and in the vision and objectives. However, in order to ensure a strong focus on this aspect by the DMC, OMC and RSC going forward, the different elements of community participation and beneficiation are consolidated below.

1.) Socio-Economic Development

Socio-economic development is a key aspect of the RMP and is captured in the Vision for the Dam. The area around the Dam is extremely

poor and the development potential of the Dam at this point has not been utilised to improve the livelihoods of the local community. Therefore socio-economic development is a key factor of the vision for the Dam – "*Mthatha Dam: the heart of our tourism and recreation hub, developed sustainably and safely to create opportunities for our community whilst improving water quality and resource management in the area.*"

There is also a specific objective and a number of related actions regarding community beneficiation and sustainable development:

**Community beneficiation through the creation of a sustainable economy based on the development of Mthatha Dam**

- Integrated tourism plan to be developed. This should include potential for recreational clubs, marketing strategies, improved roads and signage;
- The potential for community agriculture programmes with irrigation to be determined. These community programmes could provide food for tourism ventures in the area;
- Potential for water troughs for watering of cattle;
- The potential for a small-scale fisheries project for the local community to be determined. This would include training, provision of boats and nets etc.;
- DWS to partner with ECPTA, EC-DEDEAT, DEA and KSDLM in order to enable improved tourism at the Dam including Public Private Partnerships (PPPs) for accommodation, boat cruises, management of public access areas etc. ;
- Potential feasibility of a Butterfly Park to be assessed;
- The feasibility of linkages with Mthatha Airport and the use of the Dam by water planes;
- Development of community craft market linked to cultural village at the Dam;
- Potential for the creation of a Water sports stadium at the Dam to be determined; and
- Development *of micro-enterprises and entrepreneurs. This could be linked to tourist initiatives in the area including cultural village and craft market, Nature Reserve, Nelson Mandela (i.e. walk in the footsteps of Mandela, links to Qunu) , Wild Coast Transkei, etc.

In addition, as discussed in the Financial Plan below, Mthatha Dam can become a key economic lever for the region, thereby creating job opportunities for the local community.

One of the key mechanisms for this is the use PPPs. However in regards to potential PPPs, the following should be noted:

- A balance between high and small cap opportunities is required to ensure that revenue generation occurs together with the promotion of equitable access and job creation at the Dam; and
- While the tariff structure can be used for revenue generation, it should not be used to deny people access to the dam.

The BP has a number of specific interventions regarding this objective including the compilation of an Integrated Tourism Plan, potential for Small-Scale Fisheries at the Dam, Community Agriculture Projects and creating Water Troughs for Cattle.

2.) Equitable Use

In general, one of the main triggers for most RMPs is the issue of equitable access. At Mthatha Dam, the community has access to the Dam however there are no recreational facilities in place and the Dam is not used for recreational use (other than swimming and subsistence fishing). In order to increase community recreational use of the Dam, a specific objective related to this has been identified:

**Increased, safe and equitable access and use for recreation**

- Public access picnic areas to be created on both the DWS and Rosedale side of the Dam;
- Coordination with SwimSA to create a swimming school at the Dam;
- Zonal plan to take into account different recreational activities; and
- Discussions with South African Sports Confederation and Olympic Committee (SASCOC) and other national associations regarding the potential for the Dam to be used as a venue for national and or provincial competitions. This would also include the development of various water sports in the surrounding communities through partnerships with clubs based at different Dams or through new clubs established at the Dam.

In addition, a specific intervention in the BP is focused entirely on the creation of facilities at the two public facilities (one on either side of the Dam). It is suggested that DWS undertake the initial planning and construction while the management and maintenance of the area be included in the agreement with the IA.

Section 4.2.4.1. provides guidance on the aspects which should be included in the ToR for the DMC and RSC. Specific mention is made of Management of access objectives and Management of development targets. Section 4.2.4.2. provides the guidance on the aspects which should be included in all agreements. This includes the following:

- A mandate for programmes to assist in equitable access and redressing past imbalances at the Dam, such as sponsored gate-fees for members of previously disadvantaged communities. This should be in line with the RMP. The DMC will then be required to report against all targets at the OMC.; and
- All agreements must include a cancellation clause should community access targets not be met.

3.) Skills Development and Training

The RMP also focuses on skills development and training through one of the objectives (and related actions items – listed below).

**Community skills development, awareness and training**

- Lifeguard skills training and first aid training to ensure safe public use of the Dam;
- Awareness campaign to be developed by the DMC. The campaign should focus on potential uses of the Dam, the importance of infrastructure (to ensure no vandalism), Dam safety and the Dangers of swimming across the Dam; and
- Discussions between local schools and universities regarding the potential for using the Dam as part of education programmes.

The BP has a specific intervention relating to development and implementation of a skills training programme as there is an opportunity for local community members to obtain skills (such as first aid) to be employed at the public access area as 'lifeguards'. This would have the added benefit of improving community safety at the Dam.

## 4.3 Financial Plan

Mthatha Dam is an economic lever and can become central to development in the Region. The RMP provides guidance on cost recovery mechanisms to ensure the sustained and improved management of the Dam.

Currently no income is generated from recreational use at the Dam.

There are opportunities for PPPs which could further unlock the economic potential of the Dam.

With PPPs, the private party assumes the financial, technical and operational risks but

receives a benefit for this. PPPs allow for DWS to make State Assets such as Dams available to private parties who wish to engage in tourism related commercial operations (DWAF, 2009). This risk sharing mechanism aims to unlock socio-economic potential of State Dams. In addition, development of PPPs in remote areas often require related infrastructure upgrades and thus there is the opportunity for new infrastructure investment and development and related services which would benefit local communities.

Although high cap PPPs result mostly in revenue generation, small cap opportunities (less than R10 million (2007 figures) are more likely to fulfil socio-economic objectives such as job creation, promotion of Broad-Based Black Economic Empowerment, Local Economic Development and Small, Medium and Micro Enterprises. A balance between high and small cap opportunities is required to ensure that revenue generation occurs together with the promotion of equitable access and job creation at the Dam.

Further, Mthatha Dam is a State Resource and as such all profits made from the recreational use of the Dam should be used for further development of the Dam.

While the fees for use of the Dam can be used for revenue generation, it should not be used to deny people access to the Dam. Thus it should take into account the socio-economic status of recreational users. For example, a sliding scale, cross subsidy fee structure and/or contractual obligations which ensure equitable access must be considered when setting a fee.

The BP provides a financial framework to undertake certain interventions.

## 4.4 Zonal Plan

The Zonal Plan for Mthatha Dam has three main sections. The first involves the current recreational activities together with an identification of potential recreational and/or commercial opportunities. This section also includes the determination of carrying capacity. The second involves the shoreline management zones (together with preferred activities within each zone) and the third involves surface management zones (together with preferred activities within each zone).

### *4.4.1 Current Recreational Uses*

Formal recreational use (formalised clubs etc.) does not take place at the Dam at this point. The Dam is used informally for recreation by the adjacent communities and the most common activities include:

- Swimming;
- Picnicking; and
- Subsistence Fishing.

Occasionally the Dam is also used by tourists to the area and local websites note that fishing from boats, skiing and canoeing are popular activities.

### *4.4.2 Potential Recreational and/or Commercial Opportunities and Uses*

A matrix model was used to determine the feasibility of possible recreational and eco-tourism activities in line with the operational requirements of the Dam, the biophysical environmental conditions and safety requirements. The scores utilised to determine viability are as follows:

*Table 8: Scores for Recreational Use*

| Score | Meaning | Comment |
|---|---|---|
| 0 | Not feasible | High Negative Impact to Dam Environment + High Negative Impact to Recreational Users Text provided in red highlights the specific factors which make the activity not feasible at the Dam. |
| 1 | Likely to be feasible however feasibility study is required. | **Feasibility Study is required** |
| 2 | Likely to be feasible | Benefits appear to outweigh impacts.<br>Allowed should there be an interest.<br>Adequate agreements and safety measures would be required as per RMP. **No feasibility study is required.** |
| 3 | Current use | Benefits outweigh impacts.<br>**No feasibility study is required.** |

The main potential activities include:

- Guided Birding Hiking trails around the Dam;
- Day cycling trails;
- Restaurant, Conference Facility and Sunset bar;
- Arts and Craft Markets;
- Wedding Venue;
- Water Park;
- Swimming School for Local community;
- Public Access Area;
- Accommodation at LNR;
- Flying boats/Water Planes;
- House Boats;
- Game viewing by Boat;
- Junior Angling School;
- Junior Sailing School;
- Ferry System; and
- Potential small-scale fishery.

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*Table 9: Potential and Current Recreational Activities*

| Contact Type | Activity | Operational Management Issues | | Environmental Impacts on Recreational Use | | | Recreational Use Impacts on the Environment | | | Safety Requirements | | | | | Recreational Requirements | | | | Legal Requirements | | Economic Viability | | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Change in Water Level | Impacts on Dam Wall | Water Quality | Health Impacts | Aquatic Invasive Species | Fish Spawning | Bird Nesting | Water Quality | AtoN and Demarcation Markers | Water Depth | Visibility | Radio Signal | Emergency Response | Conflicts with current activities | Winds required | Accommodation | Ablution facilities | Access to water | Access to Land | Interest in the activity | Funding Opportunities | |
| No Contact | Guided Bird Viewing Hiking/ Walking Trail | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances but can be mitigated through well-chosen routes that do not impact bird nesting | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | Not required for Day hikes | Ablution facilities would be required | Not required | Land issues to be resolved | Guided trails are generally popular especially in light of the sensitive bird species in the area | LNR/PPP | 2 |
| | Day Cycling Trails | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances but can be mitigated through well-chosen routes that do not impact bird nesting | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | Not required | Ablution facilities would be required at Public areas | Not required | Land issues to be resolved | Mountain biking and adventure cycling is a popular activity in the area | LNR/PPP | 2 |
| | Public Picnic Areas | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances can be mitigated through site selection | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | Picnic spots and braai facilities would be required | Ablution facilities would be required | Access agreement with DWS would be required | Land issues to be resolved | Informal picnics already occur however there is no formal picnic area in place | LNR/PPP | 2 |
| | Conference Facility at LNR | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances can be mitigated through site selection | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | Facilities in place | Facilities in place but not yet open | Access agreement with DWS would be required | Land issues to be resolved | Mthatha Dam Master Plan | LNR/PPP | 2 |
| | Restaurant and Sunset Bar | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances can be mitigated through site selection | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | Facilities in place | Facilities in place but not yet open | Access agreement with DWS would be required | Land issues to be resolved | Mthatha Dam Master Plan | LNR/PPP | 2 |
| | Arts and Craft Market | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances can be mitigated through site selection | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | Market facilities would be required | Ablution facilities would be required | Not required | Land issues to be resolved | Mthatha Dam Master Plan | LNR/PPP | 1 |
| | Quad biking | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances can be mitigated through site selection. May also impact on erosion. | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | Quad bike route would be required as well as access control and safety management | Ablution facilities would be required | Not required | Land issues to be resolved | Mentioned at Public meeting | LNR/PPP | 1 |
| | Wedding venue /marquee | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances can be mitigated through site selection | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | Facilities would be requried | Ablution facilities would be required | Not required | Land issues to be resolved | Mthatha Dam Master Plan | LNR/PPP | 1 |
| | Traditional Ceremonies | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances can be mitigated through site selection | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | No facilities are required | N/A | Not required | Land issues to be resolved | Current activity | N/A | 3 |
| | Water Park | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances can be mitigated through site selection | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | Picnic spots and braai facilities would be required | Facilities required | Access agreement with DWS would be required | Land issues to be resolved | Mthatha Dam Master Plan | LNR/PPP | 1 |

| Contact Type | Activity | Operational Management Issues | | Environmental Impacts on Recreational Use | | | Recreational Use Impacts on the Environment | | | Safety Requirements | | | | | Recreational Requirements | | | | Legal Requirements | | Economic Viability | | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Change in Water Level | Impacts on Dam Wall | Water Quality | Health Impacts | Aquatic Invasive Species | Fish Spawning | Bird Nesting | Water Quality | AtoN and Demarcation Markers | Water Depth | Visibility | Radio Signal | Emergency Response | Conflicts with current activities | Winds required | Accommodation | Ablution facilities | Access to water | Access to Land | Interest in the activity | Funding Opportunities | |
| | Accommodation at LNR | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | Facilities required | Facilities required | Agreement with DWS required | Extent of LNR to be determined. | Mthatha Dam Master Plan | LNR/PPP | 1 |
| | Guided Horse Riding trails | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances can be mitigated through route selection | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | N/A | N/A | Not required. | Facilities required | Not required | Land issues to be resolved | Horse riding is popular activity | LNR/PPP | 2 |
| | Birding | Water levels should not impact no contact activities | No impact | N/A | N/A | N/A | N/A | Potential disturbances can be mitigated through site selection | N/A | N/A | N/A | N/A | Cell-phone reception available | Emergency response as part of IA's mandate | May be disturbed by noise from recreational users | N/A | Bird Hide Required | Not Required | Not required | Land issues to be resolved | Large number of bird species | Not Required | 2 |
| Primary Contact | Open Water Swimming – Recreational | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | N/A | Would be required | Acceptable for swimming | Acceptable | Cell-phone reception available | None. Would require UPN System | Zoning would need to be adjusted to accommodate swimmers | N/A | Not required | Required | Formal access point required | Land issues to be resolved | Current activity | DWA funding for picnic area | 3 |
| | Open Water Swimming – Development Programme | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | N/A | Would be required | Acceptable for swimming | Acceptable | Cell-phone reception available | None. Would require UPN System | Zoning would need to be adjusted to accommodate swimmers | Not required. | Not required | Required | Formal access point required | Land issues to be resolved | Community is interested | SwimSA, Telkom Splash or similar foundations. Coordination with schools may also be possible. | 2 |
| | Snorkelling | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | N/A | Would be required | Acceptable for swimming | Water is too turbid for snorkelling or diving | Cell-phone reception available | None. Would require UPN System | Zoning would need to be adjusted to accommodate snorkelers | N/A | Not required | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | None at present | N/A | 0 |
| | Diving | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | N/A | Would be required | Acceptable for swimming | Water is too turbid for snorkelling or diving | Cell-phone reception available | None. Would require UPN System | Zoning would need to be adjusted to accommodate divers | N/A | Not required | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | None at present | N/A | 0 |
| Secondary Contact | Small Scale Fishery | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | Fishing of invasive species may assist indigenous population | May disturb bird nesting | Maintenance of boats and equipment required to prevent contamination | Would be required | N/A | N/A | Cell-phone reception available | None. Would require UPN System | N/A | N/A | Facilities and infrastructure required. | Facilities and infrastructure required. | Formal access point required | Land issues to be resolved | Community would be interested but numbers of fish are currently unknown | PPPs/DAFF | 1 |
| | Subsistence Fishing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | Fishing of invasive species may assist indigenous populations | May disturb bird nesting | Maintenance of boats and equipment required to prevent contamination | Would be required | N/A | N/A | Cell-phone reception available | None. Would require UPN System | N/A | N/A | Facilities and infrastructure required. | Facilities and infrastructure required. | Formal access point required | Land issues to be resolved | Currently occurs | N/A | 3 |
| | Shore Fishing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | The Zonal map should prevent impacts | None | None | Required | N/A | N/A | Cell-phone reception available | None. Would require UPN System | Shore fishing takes place currently | No required | Not required | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Current activity | DWS funding for picnic area | 3 |
| | Tube Fishing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | N/A | No winds would be required | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Potential interest | N/A | 2 |

| Contact Type | Activity | Operational Management Issues | | Environmental Impacts on Recreational Use | | | Recreational Use Impacts on the Environment | | | Safety Requirements | | | | | Recreational Requirements | | | | Legal Requirements | | Economic Viability | | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Change in Water Level | Impacts on Dam Wall | Water Quality | Health Impacts | Aquatic Invasive Species | Fish Spawning | Bird Nesting | Water Quality | AtoN and Demarcation Markers | Water Depth | Visibility | Radio Signal | Emergency Response | Conflicts with current activities | Winds required | Accommodation | Ablution facilities | Access to water | Access to Land | Interest in the activity | Funding Opportunities | |
| | | | | | | | | | | | | | | | | however safety is a concern as strong winds can occur at the Dam. | | | | | | | |
| | Pontoon Fishing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | N/A | No winds would be required however safety is a concern as strong winds can occur at the Dam. | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Potential interest | N/A | 2 |
| | Bass Fishing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No current conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Bass fishing is popular – numbers of bass at the Dam are unknown | N/A | 2 |
| | Motorised Boats | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No current conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Motorised boats are very popular | N/A | 2 |
| | Jet Powered Boats | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No current conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Similar to motorised boats | N/A | 2 |
| | RHIB (Rigid Hulled Inflatable Boat) | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No current conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Similar to motorised boats | N/A | 2 |
| | Water-skiing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No current conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Jet Ski | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Dragon Boats | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | No winds would be required however safety is a concern as strong winds can occur at the Dam | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | No interest at this point | N/A | 2 |
| | Slalom Canoe | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | No winds would be required however safety is a concern as strong winds can occur at the Dam | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Canoeing is popular | N/A | 2 |
| | Fishing Canoe | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | Canoeing occurs at the Dam | No winds would be | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Fishing and kayaking are both | N/A | 2 |

| Contact Type | Activity | Operational Management Issues | | Environmental Impacts on Recreational Use | | | Recreational Use Impacts on the Environment | | | Safety Requirements | | | | | Recreational Requirements | | | | Legal Requirements | | Economic Viability | | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Change in Water Level | Impacts on Dam Wall | Water Quality | Health Impacts | Aquatic Invasive Species | Fish Spawning | Bird Nesting | Water Quality | AtoN and Demarcation Markers | Water Depth | Visibility | Radio Signal | Emergency Response | Conflicts with current activities | Winds required | Accommodation | Ablution facilities | Access to water | Access to Land | Interest in the activity | Funding Opportunities | |
| | | | | | | | | | | required | | | | | | required however safety is a concern as strong winds can occur at the Dam | | | | | | popular | | |
| | Jet Ski Fishing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Both jet skiing and fishing are popular so likely to be popular | N/A | 2 |
| | Wind Surfing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | Yes, winds available | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Kite Surfing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | Yes, winds available | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Ski Jumping | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Slalom Skiing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Ski and Wakeboard Boat | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | None | None | None | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Kayaking Sprints | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Unknown | N/A | 2 |
| | Kayaking Marathons | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Unknown | N/A | 2 |
| | Kayaking Water Polo | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users zoning to prevent major conflict | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Unknown | N/A | 2 |
| | Kayaking Touring | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No conflict – restricted to shoreline | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Likely to be popular – area is unspoilt | N/A | 2 |
| | Kayaking Fishing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No conflict – restricted to shoreline | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Fishing and canoeing are both popular | N/A | 2 |
| | Paddle Ski | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No conflict – restricted to shoreline | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Surf Ski | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Unknown | N/A | 2 |

| Contact Type | Activity | Operational Management Issues | | Environmental Impacts on Recreational Use | | | Recreational Use Impacts on the Environment | | | Safety Requirements | | | | | Recreational Requirements | | | | Legal Requirements | | Economic Viability | | Score |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Change in Water Level | Impacts on Dam Wall | Water Quality | Health Impacts | Aquatic Invasive Species | Fish Spawning | Bird Nesting | Water Quality | AtoN and Demarcation Markers | Water Depth | Visibility | Radio Signal | Emergency Response | Conflicts with current activities | Winds required | Accommodation | Ablution facilities | Access to water | Access to Land | Interest in the activity | Funding Opportunities | |
| | Pedal Boat | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | N/A | Zoning AtoN and Demarcation Markers require | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No conflict – restricted to shoreline | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Potential activity | N/A | 2 |
| | Hovercraft | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | Disturbance to local fauna | Disturbance to local fauna | Disturbance to local environment | N/A | Depth is suitable | Not required | Cell-phone reception available | None. Would require UPN System | Conflicts with sense of place and current use | N/A | Not required | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | None at present | N/A | 0 |
| | Stand Up Paddling | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | N/A | Zoning AtoN and Demarcation Markers require | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | None foreseen at present | Not required. | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Parasailing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users, zoning to prevent major conflict | The Dam is known for strong winds | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Sailing | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | No impact | No impact | No impact | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with other users, zoning to prevent major conflict | The Dam is known for strong winds | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Water Toys | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | N/A | Zoning AtoN and Demarcation Markers required | N/A | Safety concern as not visible to bigger craft,flags and other safety measures required | Cell-phone reception available | None. Would require UPN System | None foreseen at present | No | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Generally popular activity | N/A | 2 |
| | Flying Boats/Water Planes | N/A | Spillway is a safety issue | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | Disturbance to local fauna | Disturbance to local fauna | Disturbance to local environment | Specific aviation requirement would need to be met | Some sections of the Dam are very deep | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with recreational use | N/A | Not required | Not required | Formal access point required | Land issues to be resolved | Potential linkage to Mthatha Airport | N/A | 1 |
| | House Boats | Water level does not fluctuate greatly | Spillway is a safety issue | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | Possible pollution from litter | Zoning AtoN and Demarcation Markers required | Unknown – would need to be determined | N/A | Cell-phone reception available | None. Would require UPN System | Conflicts with current recreational operating hours | N/A | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Potential activity as part of PPP | PPP | 1 |
| | Game viewing by boat | Water level does not fluctuate greatly | Spillway is a safety issue | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | Possible pollution from litter | Zoning AtoN and Demarcation Markers required | Dam is relatively shallow | N/A | Cell-phone reception available | None. Would require UPN System | May conflict with conservation | N/A | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Game viewing by boat is likely to be popular | PPP | 1 |
| | Ferry System | Water level does not fluctuate greatly | Spillway is a safety issue | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | Possible pollution from litter | Zoning AtoN and Demarcation Markers required | Dam is relatively shallow | N/A | Cell-phone reception available | None. Would require UPN System | N/A | N/A | N/A | N/A | Formal access point required | Land issues to be resolved | The Dam separates the two communities and thus a ferry system would be helpful | DWS/Part of PPP | 1 |
| | Junior Angling School | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | N/A | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No | Not required | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Community showed interest in recreational fishing involvement | Angling Clubs | 1 |
| | Junior Sailing School | N/A | N/A | Water quality can be an issue | Algal blooms can occur | Water Hyacinth may occur | N/A | N/A | N/A | Zoning AtoN and Demarcation Markers required | Depth is suitable | N/A | Cell-phone reception available | None. Would require UPN System | No | Not required | N/A | Ablution facilities required at Public Access Area | Formal access point required | Land issues to be resolved | Community showed interest in recreational involvement | Sailing clubs | 1 |

### *4.4.3 Carrying Capacity*

In order to determine the degree of recreational use possible on the water surface, the Methodology for Carrying Capacity Assessment: Recreational Water Use was used as a guideline to determine the level of activity that would be sustainable at Mthatha Dam.

Calculating carrying capacity for recreation is a vital step to ensure that recreation at the Dam is safe and that users do not feel crowded and enjoy their use of the Dam as a venue for recreation. There are three kinds of carrying capacity:

1. Physical Carrying Capacity (PCC). This is the maximum number of users that can physically fit onto the water surface at any given time.

2. Real Carrying Capacity (RCC). This is the maximum number of users that can use the resource once corrective factors (such as wildlife or weather conditions) that are unique to the dam are taken into account.

3. Effective (permissible) Carrying capacity (ECC). This is the number of visitors that can use the resource, given the management capacity available at the dam.

#### 4.4.3.1. Physical Carrying Capacity (PCC)

PCC is calculated as PCC = A ÷ U/a x Rf

- Where A = area available for public use;
- U/a = area required for each user; and
- Rf = Rotation Factor (the number of visits per day)

A is calculated as the area of the water surface: 19.26 km $^2$, or 1 926 hectares (ha)

U/A = There is a range of literature regarding the area required for different recreational users. The U/A used for that assessment are as follows:

| Craft | Water Depth (m) | U/A (ha/ craft) |
|---|---|---|
| Canoes | >0.6 | 0.5 |
| Windsurfers | >0.6 | 0.5 |
| Rowing | >1.0 | 0.5 |
| Dinghies | >1.0 | 1.0 |
| Yachts | >1.8 | 2.0 |
| Fishing | >1.0 | 4.0 |
| Power boats | >1.4 | 4.0 |

Based on the fact that most activities do not require much space, and the largest area per user required is 4.0 ha, the U/a is assumed to 4 ha/user or0.04 km$^2$/user.

As Mthatha is quite remote it is unlikely that people would use the Dam more than once per visit. It is far more likely that visitors to the Dam would spend the majority of the day on the water surface. In this case RF = 1.

The PCC for Mthatha Dam can therefore be calculated as:

PCC = 1 926÷ 4x 1

PCC = 481 boats on the Dam.

However, this is based on the full length of the Dam at 100% capacity. It also doesn't take into account the zoning of the Dam.

#### 4.4.3.2. Real Carrying Capacity (RCC)

Real capacity is the PCC, taking into account factors that limit recreation. In this case limiting factors include:

- Dam Wall Buffers;
- Conservation Go Zones;
- Safety No Go Zones; and
- Swimming Areas.

The above factors result in an 10.9 % decrease in water area available for recreation at the Dam (Area available for use decreases from 1 976 ha (19.76 km$^2$) to 1 715 ha (17.15 km$^2$). Therefore, 89.1% of the surface area of the Dam is still available for recreation.

The RCC for Mthatha Dam is therefore:

- RCC = PCC x (100 – Cf1) % x (100 – Cf2) % x … (100 – Cfn)%

- Where Cf = a corrective factor expressed as a percentage.
- RCC = 481 x (100 –10.1)%

RCC = 428 boats on the Dam at any given time, ***Based on water surface.***

#### 4.4.3.3. Effective (permissible) Carrying Capacity (ECC)

Effective Carrying Capacity is the maximum number of visitors that a site can sustain, given the management capacity available. Given that Mthatha Dam has no management capacity in place, it is assumed that the ECC is currently 0.

- ECC = [Infrastructure Capacity x MC]/ RCC
- Where: ECC = Effective Carrying Capacity;
- MC = Management capacity based on staff and budget;
- RCC = Real Carrying Capacity

Once agreements are in place, the ECC will need to be recalculated based on management capacity.

### *4.4.4 Water Surface Zonal Plan*

The Zonal plan for the water surface at Mthatha Dam is divided into nine distinct areas or zones. These zones are based on a number of factors including:

- Operational requirements of the Dam;
- Safety requirements of each activity;
- Types of activities (in terms of contact); and
- Environmental requirements.

The overall zonal map is provided in the figure below.

The zones are as follows:

- Zone A: Secondary Contact: Combination Zone. Both Sailing. Motorized activities and Fishing Activities are allowed in this zone however due to shallow nature along the shoreline and to prevent conflict between users, all activities to be kept at a no wake speed;
- Zone B: Primary Contact – Swimming and Water Toys. This blue zone is a zone available for swimming and the use of water toys;
- Zone C: No Go Zone – Dam Wall. This is the area around the Dam Walls and is denoted in orange. No access to the public is allowed;
- Zone D: No Go Zone – Safety Buffer. This is the area around the abstraction points and the swimming areas. No access for safety reasons.
- Zone E: No Go Zone – Conservation – This is no go conservation reasons and includes the river inlets around the Dam.
- Zone F: Secondary Contact – Motorised Boats and Sailing. This zone is designated for the use of motor boats and sailboats at high speed;
- Zone G: Jet Ski Only – This area is for jet ski's only;

Detailed information of the current and potential activities in each zone is provided in Table 10 below. Information on requirements for each zone is also provided.

*Table 10: Surface Water Management Zones*

| Zone Name | Contact Type | Permissible Activities – Current | Permissible Activities – Potential | Access Point | Safety Requirements for Users | Safety Requirements for DMC |
|---|---|---|---|---|---|---|
| Zone A | Secondary Contact – Combination | No current formal activities take place.<br>Informal activities include:<br>Shore Fishing<br>Subsistence fishing | Commercial/ Small Scale Fishery<br>Ferry system<br>Tube Fishing<br>Pontoon Fishing<br>Bass Fishing – no wake<br>Motorised Boats – no wake<br>Jet Powered Boats – no wake<br>RHIB – no wake<br>Jet Ski – no wake<br>Dragon Boats<br>Slalom Canoe<br>Fishing Canoe<br>Jet Ski Fishing – no wake<br>Wind Surfing – no wake<br>Kite Surfing – no wake<br>Ski and Wakeboard Boat – no wake<br>Kayaking Sprints<br>Kayaking Marathons<br>Kayaking Water Polo<br>Kayaking Touring<br>Kayaking Fishing<br>Paddle Ski<br>Pedal Boat<br>Stand Up Paddling<br>Parasailing - no wake<br>Sailing – no wake<br>House Boats<br>Game viewing by boat<br>Junior Angling School | Potential DWS Access<br>LNR Potential Access<br>Highbury potential ferry access<br>Nkanini potential ferry access<br>Ntili potential ferry access | Registered Safe for Water Vessel<br>Valid Skipper's License<br>First Aid Kit<br>UPN date stamp<br>UPN tag | Land ownership and compensation to be resolved<br>AtoN and Demarcation Markers<br>UPN System<br>OPS Point<br>Wash Bay<br>Rescue Boat available at all times<br>Wash Bay Officer<br>Enforcement Officer<br>LNR will require system for checking UPN Tags |
| Zone B | Primary Contact – Swimming and Water Toys | Swimming – recreational | Swimming – Development School<br>Water Toys | Potential DWS Access<br>LNR Potential Access<br>Quelane Picnic site | | AtoN and Demarcation Markers<br>UPN system<br>OPS point<br>Rescue Boat available at all times |

| Zone Name | Contact Type | Permissible Activities – Current | Permissible Activities – Potential | Access Point | Safety Requirements for Users | Safety Requirements for DMC |
|---|---|---|---|---|---|---|
| Zone C | No Go Zone – Dam Wall | DWA maintenance and management activities | None | DWS potential access | N/A | AtoN and Demarcation Markers |
| Zone D | No Go Zone – Safety | None | None | N/A | N/A | AtoN and Demarcation Markers |
| Zone E | No Go Zone – Conservation and Erosion | Research and Management | None | DWS potential access | Registered Safe for Water Vessel<br>Valid Skipper's License<br>First Aid Kit<br>UPN date stamp<br>UPN tag<br>Research Permit from DWS | Land ownership and compensation to be resolved<br>AtoN and Demarcation Markers<br>UPN System<br>OPS Point<br>Wash Bay<br>Rescue Boat available at all times<br>Wash Bay Officer<br>Enforcement Officer<br>LNR will require system for checking UPN Tags |
| Zone F | Secondary Contact – Motorised Boats and High speed Sailboats | No current activities | Bass Fishing<br>Motorised Boats<br>Jet Powered Boats<br>RHIB<br>Jet Ski<br>Wind Surfing<br>Kite Surfing<br>Ski Jumping<br>Slalom Skiing<br>Ski and Wakeboard Boat<br>Surf Ski<br>Parasailing<br>Sailing<br>Flying Boats/Water Planes<br>Junior Sailing School<br>Water Skiing | Potential DWS Access<br>LNR Potential Access | Registered Safe for Water Vessel<br>Valid Skipper's License<br>First Aid Kit<br>UPN date stamp<br>UPN tag | Land ownership and compensation to be resolved<br>AtoN and Demarcation Markers<br>UPN System<br>OPS Point<br>Wash Bay<br>Rescue Boat available at all times<br>Wash Bay Officer<br>Enforcement Officer<br>LNR will require system for checking UPN Tags |

| Zone Name | Contact Type | Permissible Activities – Current | Permissible Activities – Potential | Access Point | Safety Requirements for Users | Safety Requirements for DMC |
|---|---|---|---|---|---|---|
| Zone G | Secondary Contact – Jet Ski Only | Jet Ski | None | Potential DWS Access<br>LNR Potential Access | Registered Safe for Water Vessel<br>Valid Skipper's License<br>First Aid Kit<br>UPN date stamp<br>UPN tag | Land ownership and compensation to be resolved<br>AtoN and Demarcation Markers<br>UPN System<br>OPS Point<br>Wash Bay<br>Rescue Boat available at all times<br>Wash Bay Officer<br>Enforcement Officer<br>LNR will require system for checking UPN Tags |

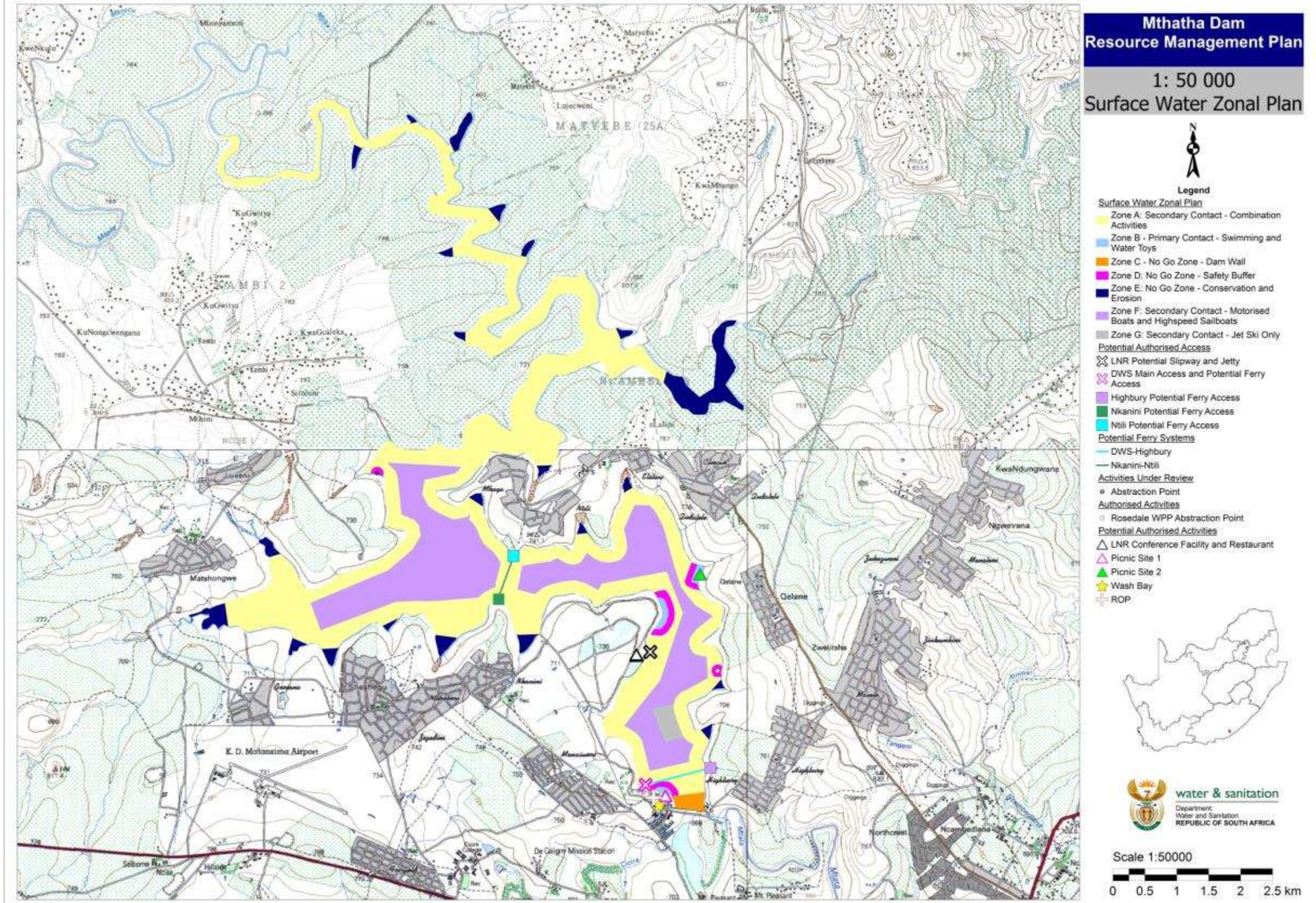


*Figure 19: Map of the Water Surface Zonal Plan*

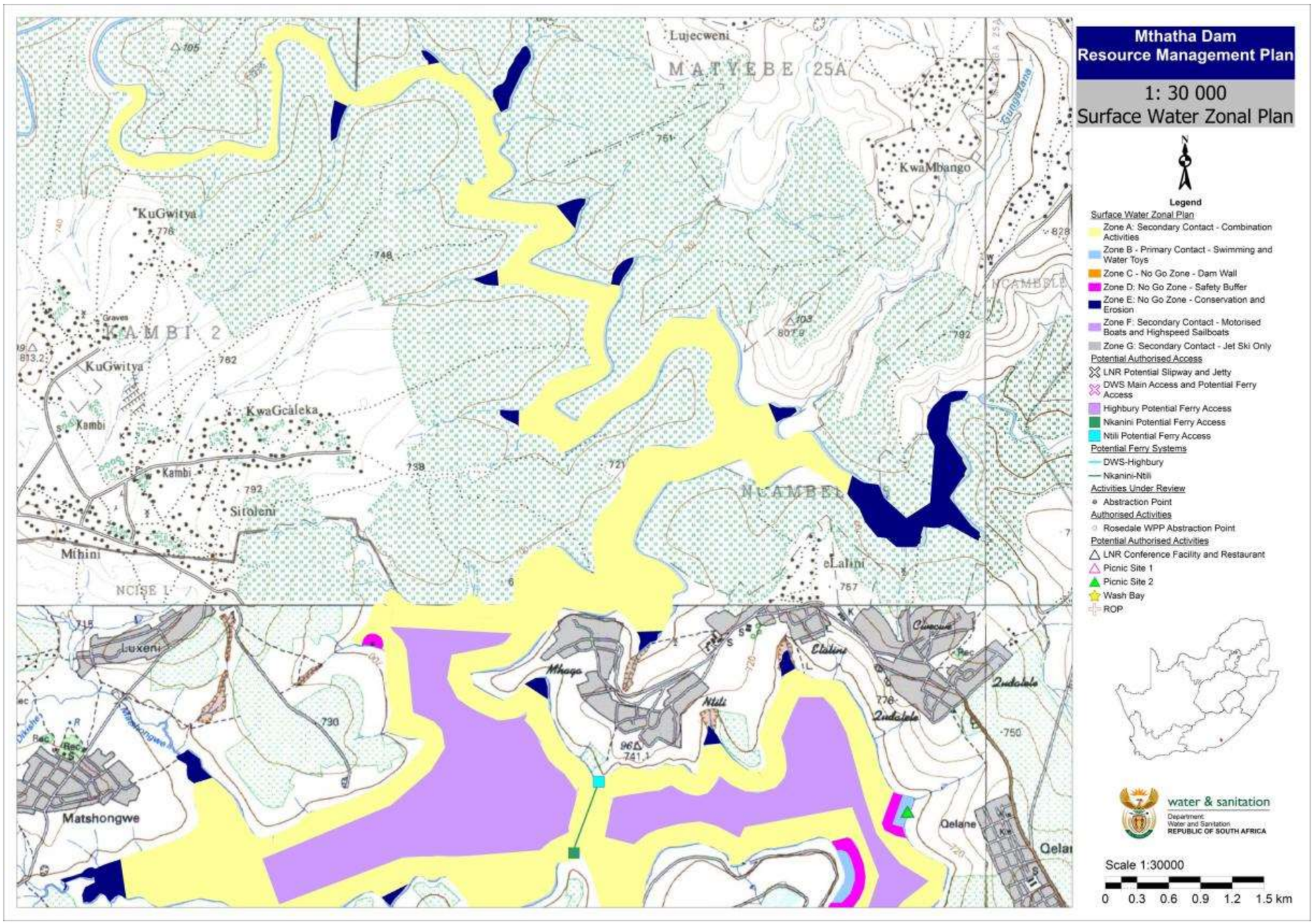


*Figure 20: Map of the Water Surface Zonal Plan – Section 1*

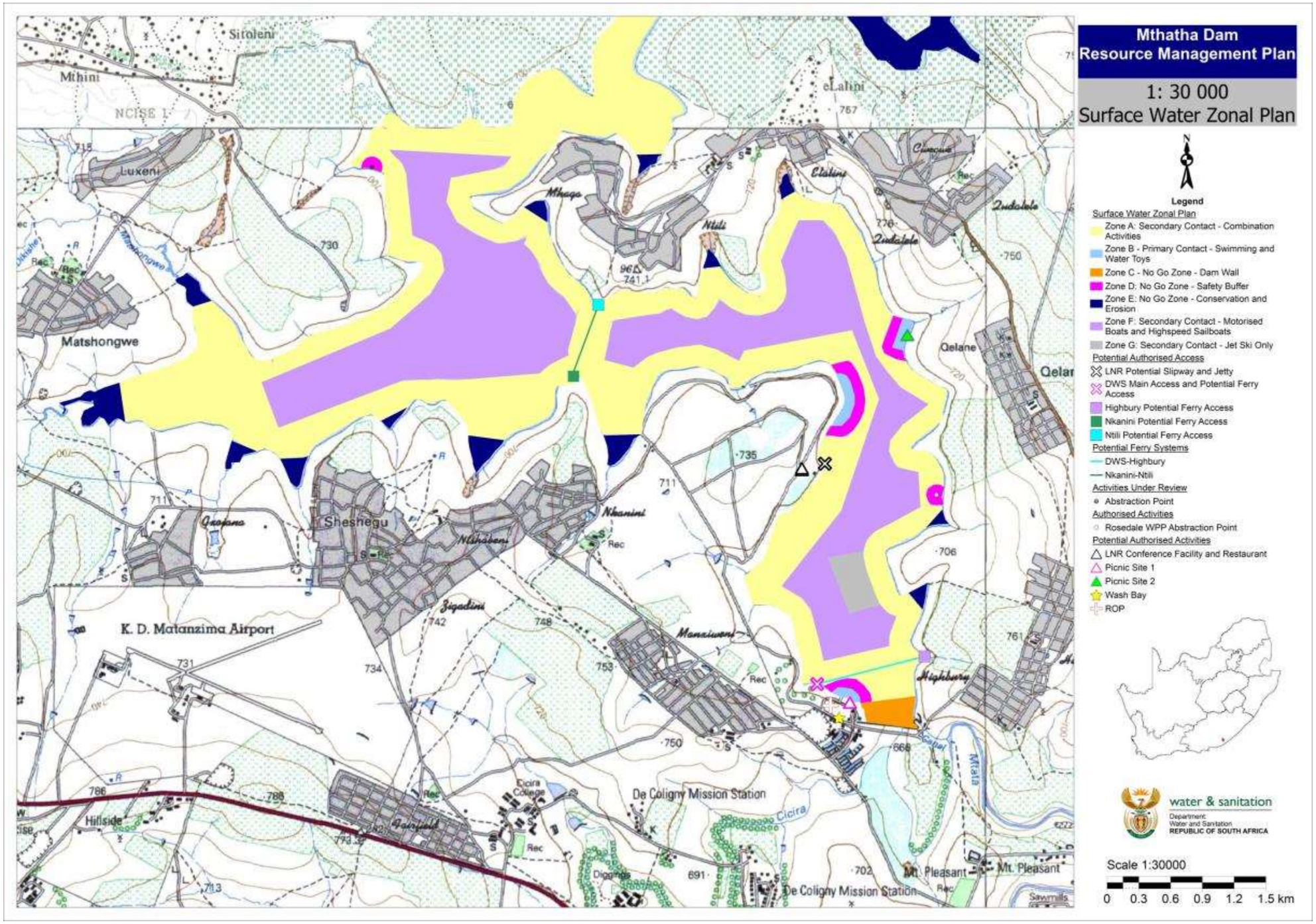


*Figure 21: Map of the Water Surface Zonal Plan – Section 2*

### *4.4.5 Shoreline Zonal Plan*

In addition to the surface water Zonal Plan above, an integral part of the RMP is shoreline zoning. This provides guidance on what activities (if any) are allowed in the land adjacent to the Dam. In the case of Mthatha Dam, DWS does not have a purchase boundary in place and no shoreline zonal plan could be compiled. One of the critical actions in the Strategic Plan and BPs is to survey of the Shoreline boundary and determine the full supply line and buffer. Once the shoreline has been surveyed and purchased, a shoreline zonal plan should be compiled in line with the RMP. The following management zones are suggested:

- Zone A – Conservation and Recreation/Tourism
- Zone B – Development and Recreation
- Zone C- Management – No Access to the Public

Zone A includes the majority of LNR and focusses mainly on conservation and ecotourism activities such as camping, hiking, birding and game viewing. These areas should be along the inlets and where any erosion spots currently occur.

Zone B allows for conservation, high intensity recreation and development for tourism purposes allowing for the potential development of the following:

- Public picnic areas;
- Accomodation;
- Water Park;
- Arts and Craft Market;
- Ferry system;
- Wash Bay;
- Recreational club areas; and
- Swimming, Fishing and Sailing Development Schools.

Areas of the shoreline adjacent to current peri-urban villages should be zoned as Zone B. Should it be assessed as feasible quad biking may be allowed in the zone (subject to DWS approval).

Zone C provides for land management of state land but does not allow public use or access. This includes the area around the Dam wall.

Permissible activities are detailed in the table below.

*Table 11: Shoreline Management Zones*

| Zone Name | Zone Type | Permissible Activities | Requirements for Users | Requirements for DMC |
|---|---|---|---|---|
| Zone A | Zone A: Conservation and limited recreation - LNR | Conservation initiatives<br>Management of firebreaks<br>Management of litter<br>Management of Invasive Plant Species<br>Hiking<br>Cycling<br>Horse riding trails<br>Bird watching<br>Shoreline fishing<br>Shoreline fishing competitions<br>Picnicking<br>Grazing – in line with shoreline management plan<br>Access to the ferry system | Camping, birding, hiking, picnicking, shoreline fishing and access to the water must be done in accordance to access agreements<br>Noise levels to be kept at a minimum.<br>No littering at Picnic spots<br>All users bringing boats to go through Wash Bay<br>All activities to be formalised and agreements drafted before the expansion of existing facilities<br>No private slipways to be built without approval from DWA. In addition Section 21 I. and (i) Water Use License Application (WULAs) would be required | Land ownership and compensation to be resolved<br>Proclamation status and extent of LNR to be determined<br>Zonal maps to be updated with new land ownership/nature reserve status information<br>Enforcement Officer to check all designated picnic spots<br>Feasibility of employing local community members as part of "Working For Dams" programme to be assessed. Potential jobs include management of picnic sites/picking up of any litter<br>DMC must ensure that all developments have been approved by DWA and DMC.<br>Requirements of National Water Act and National Environmental Management Act must be taken into account<br>All developments should have an approved Environmental Management Plan (EMP) to ensure construction does not impact on Dam<br>UPN system to be put in place |
| Zone C | Recreation and Development | Development and Expansion of facilities/infrastructure for recreation<br>Development of facilities/infrastructure for development/training<br>Development of facilities/infrastructure for tourism<br>Fishing<br>Camping/Accommodation<br>Birding<br>Picnicking<br>Access to surface water for recreational purposes | Camping, birding, hiking, picnicking, shoreline fishing and access to the water must be done in accordance to access agreements<br>Camping allowed only in designated areas<br>Noise levels to be kept at a minimum.<br>No littering at Picnic spots<br>All users bringing boats to go through Wash Bay<br>All activities to be formalised and agreements drafted before the expansion of existing facilities<br>No private slipways to be built without approval from DWA. In addition Section 21 I. and (i) Water Use License Application (WULAs) would be required | Land ownership and compensation to be resolved<br>Proclamation status and extent of LNR to be determined<br>Zonal maps to be updated with new land ownership/nature reserve status information<br>Enforcement Officer to check all designated picnic spots<br>Feasibility of employing local community members as part of "Working For Dams" programme to be assessed. Potential jobs include management of picnic sites/picking up of any litter<br>DMC must ensure that all developments have been approved by DWA and DMC.<br>Requirements of National Water Act and National Environmental Management Act must be taken into account<br>All developments should have an approved Environmental Management Plan (EMP) to ensure construction does not impact on Dam<br>Wash Bay system to be put in place<br>UPN system to be put in place |
| Zone D | Management – No Public Access | Fire management<br>Invasive alien species clearing<br>Management of Dam Infrastructure<br>Access to surface water for management purposes | N/A | N/A |

## 4.5 Strategic Plan

The Strategic Plan is informed by the objectives determined during the Visioning exercise and through research on feasible opportunities for the Dam.

| Objective category/major objective | What | Why | How | Who |
|---|---|---|---|---|
| **Improved management, safety and communication** | Formalised institutional structure | There is currently no formal institutional structure at the Dam which ensures proper communication between the various stakeholders | DWS to appoint members of the DMC, OMC and RSC as per the RMP | DWS |
| | Improved access control to control access to the Dam and prevent illegal abstraction | Currently there is very little access control and this allows illegal abstraction to occur | Fences and access control to be put in place at the Dam | DWS |
| | Assessment of spillway buffer to be undertaken to determine what buffer is required. The assessment should also assess what activities can take place at the Dam without compromising the spillway | The Spillway at the Dam is very steep and is a potential risk to recreational use. A buffer of 25m has been used however this should be assessed from an engineering perspective to ensure that it is adequate. The assessment should include what type of boats are allowed on the Dam that will not compromise the spillway in the event of an accident | DWS to undertake assessment<br>Zonal map to be updated with amended extent of spillway if required | DWS |
| | Spillway to be fenced off to prevent access and ensure community safety | Access to the spillway from the DWS side of the Dam occurs and some accidents have occurred. This area should be fenced off | DWS to organise discussions with the community to explain the risks associated with the spillway and the need for fencing to gain community buy in<br>DWS to fence spillway | DWS |
| | Survey of the Shoreline boundary and determination of the full supply line and buffer. The shoreline zonal plan should be compiled in line with the RMP once this information is available | No land ownership information was available at it is understood that DWS did not a purchase a shoreline buffer when the Dam was built. It is suggested that a survey of the shoreline is undertaken to determine the extent of the required buffer and to allow the purchase thereof | DWS to undertake survey | DWS |
| | Land matters to be resolved including discussions with the surrounding communities and compensation for land where necessary | No land ownership information was available as it is understood that DWS did not a purchase a shoreline buffer when the Dam was built. The management of access to the surface, erosion, etc. is difficult as DWS does not own the land around the Dam. There was also no compensation to the local community | Based on the shoreline boundary survey above, DWS should meet with Traditional leaders/landowners and negotiate purchase of shoreline and the required compensation | DWS |

| Objective category/major objective | What | Why | How | Who |
|---|---|---|---|---|
| | | | | |
| | Legalise agricultural development around the Dam | Unauthorised abstraction occurs for the Essential Oil project. This should be regulated | DWS to meet with Essential oil project management to discuss requirement for WULA.<br>Project to undertake WULA process | DWS<br>Essential Oil project |
| | Agreements with government stakeholders such as EC-DEDEAT, ECPTA, DEA and KSDLM taking into account RMP | EC-DEDEAT, ECPTA, DEA and KSDLM are in partnership to develop LNR and Mthatha Dam. They have built a conference facility, restaurant and sunset bar which is not yet operational pending agreements with DWS. In addition, there is an opportunity for recreational use at the Dam to be managed by EC-DEDEAT as part of the management of LNR. | DWS to meet with EC-DEDEAT, ECPTA, DEA and KSDLM to discuss potential partnership and the possibility of appointing EC-DEDEAT as an IA.<br>Agreements to be drafted and signed | DWS<br>EC-DEDEAT<br>ECPTA<br>DEA<br>KSDLM |
| | Unique Positioning Number (UPN) System to be implemented and extended to local communities | There is no overall safety system in place at the Dam. In addition a number of communities are located near the Dam and there is an opportunity to extend the emergency response of the UPN system to these communities | UPN system to be implemented | DWS<br>EC-DEDEAT<br>KSDLM<br>CIWSP<br>SAMSA |
| | Flood warning system to be developed to ensure downstream communities are warned of floods | During consultation, it was noted that during floods there was no adequate warning for downstream communities. There is an opportunity to link this to the UPN system | Downstream warning system to be implemented.<br>Discussions with CIWSP to determine the potential for linking this to UPN system | DWS<br>KSDLM<br>CIWSP |
| | Standardised Aids to Aids to Navigation (AtoN) and demarcation markers to be implemented | There is currently no formalised and standardised AtoN and demarcation markers at the Dam | SAMSA and DWS to undertake survey of the Dam to identify obstacles and areas which require demarcation markers<br>AtoN and Demarcation Markers to be put in place<br>Agreements between SAMSA and DWS, EC-DEDEAT regarding AtoN and Demarcation markers to be put in place | DWS<br>EC-DEDEAT<br>SAMSA |
| **Increased, safe and equitable access and use for recreation** | Public access picnic areas to be created on both the DWS and Rosedale side of the Dam | There are no public access facilities at the Dam | DWS to meet with EC-DEDEAT to discuss the possibility of appointing EC-DEDEAT as an IA.<br>Agreements to be drafted and signed<br>DWS to appoint landscape architect to design ablutions and picnic area<br>Environmental authorisations to be obtained if | DWS<br>EC-DEDEAT |

| Objective category/major objective | What | Why | How | Who |
|---|---|---|---|---|
| | | | necessary. EC-DEDEAT to manage fishing area | |
| | Coordination with SwimSA to create a swimming school at the Dam | During public consultation it was noted that children in the area often swim in the Dam. However as there are no swimming lessons, a number of drownings have occurred. | DWS to facilitate discussions between EC-DEDEAT and SwimSA regarding swimming training | DWS<br>EC-DEDEAT<br>SwimSA |
| | Zonal plan to take into account different recreational activities. Further, the shoreline zonal plan should be updated once the extent of the purchase boundary of the Dam is known | As part of the RMP a Zonal Map has been compiled and includes recreational activities. However due to the fact that the land ownership is not resolved, the shoreline zonal plan may need to be updated. | Landownership to be resolved<br>Shoreline Zonal Plan to be updated based on landownership | DWS |
| | Discussions with South African Sports Confederation and Olympic Committee (SASCOC) and other national associations regarding the potential for the Dam to be used as a venue for national and or provincial competitions. This would also include the development of various water sports in the surrounding communities through partnerships with clubs based at different Dams or through new clubs established at the Dam | There are no recreational clubs based at the Dam. There are also no events held although there is potential for this. By engaging with SASCOC and its different associations such as South African Sailing and South African Angling, it may be possible to set up Sailing and Angling Clubs at t the Dam. Alternatively, it may be possible to organise for nearby Clubs to hold events at the Dam and to develop the activities in the local community around the Dam | DWS and EC-DEDEAT to meet with SASCOC and affiliated bodies to discuss the potential for starting new clubs at the Dam<br>Agreements with clubs taking into account the RMP to be signed | DWS<br>DMC<br>EC-DEDEAT<br>SASCOC |
| **Community beneficiation through the creation of a sustainable economy based on the development of Mthatha Dam** | Integrated tourism plan to be developed. This should include potential for recreational clubs, marketing strategies, improved roads and signage | Mthatha Dam has enormous tourism potential that is not being harnessed. By developing a tourism plan which includes marketing strategies, improvement of roads and signage, development of a website for the Dam etc. it will be possible to improve tourism at the Dam. | DWS to meet with EC-DEDEAT, ECPTA, DEA and KSDLM to discuss potential partnership and the possibility of appointing EC-DEDEAT as an IA.<br>Agreements to be drafted and signed<br>EC-DEDEAT, ECPTA and KSDLM to develop and implement an integrated tourism plan | DWS<br>EC-DEDEAT<br>ECPTA<br>DEA<br>KSDLM<br>Dept of Tourism |
| | The potential for community agriculture programmes with irrigation to be | The community showed much interest in the potential for community irrigation programmes. | DAFF to determine agriculture potential of the area<br>DWS to determine water availability for agriculture | DAFF<br>DWS |

| Objective category/major objective | What | Why | How | Who |
|---|---|---|---|---|
| | determined. These community programmes could provide food for tourism ventures in the area | There is an opportunity that agriculture in the area could be developed and then the produce sold to the LNR conference facility and restaurant. This could be used as part of the marketing strategy for the restaurant | DAFF to develop and implement community agriculture project based on findings of the agriculture potential and water availability | Local Community<br>KSDLM |
| | Potential for water troughs for watering of cattle | As mentioned, landownership at the Dam is not resolved. Should the shoreline be purchased, it would need to be fenced to ensure proper access control. In addition, cattle drinking at the Dam is thought to decrease water quality at the Dam. Thus, by creating water troughs at a number of areas around the Dam it would be possible to ensure water is provided to the community for cattle watering and that the shoreline was protected from over grazing and water pollution by livestock | Based on the shoreline boundary survey, DWS should meet with Traditional leaders/landowners and negotiate purchase of shoreline and the required compensation. The discussions should include potential water trough areas and the need for fencing.<br>Water troughs to be built | DWS |
| | The potential for a small-scale fisheries project for the local community to be determined. This would include training, provision of boats and nets etc. | The community showed much interest in the potential for smallscale fisheries at the Dam | Smallscale fisheries feasibility study to be undertaken<br>Findings of the study to be implemented and if necessary, smallscale fisheries to be put in place | DWS<br>EC-DEDEAT<br>DAFF |
| | DWS to partner with ECPTA, EC-DEDEAT, DEA and KSDLM in order to enable improved tourism at the Dam including Public Private Partnerships (PPPs) for accommodation, boat cruises, management of public access areas etc. | EC-DEDEAT, ECPTA, DEA and KSDLM are in partnership to develop LNR and Mthatha Dam. They have built a conference facility, restaurant and sunset bar which is not yet operational pending agreements with DWS. In addition, there is an opportunity for recreational use at the Dam to be managed by EC-DEDEAT as part of the management of LNR.<br>The management of the conference facility etc. is planned to be though a public operator. It is therefore possible to extend the PPP to include further activities or to undertake additional PPPs for these activities. This would improve tourism to the Dam and improve the economy of the region | DWS to meet with EC-DEDEAT, ECPTA, DEA and KSDLM to discuss potential partnership and the possibility of appointing EC-DEDEAT as an IA.<br>Agreements to be drafted and signed<br>Feasibility study for conference facility etc. to be extended to include additional activities such as boat cruises, accommodation, management of public area, guided hikes, horse riding, , mountain biking, wedding facilities and water park<br>PPP to be put in place in line with National Treasury requirements | DWS<br>EC-DEDEAT<br>ECPTA<br>DEA<br>KSDLM<br>National Treasury |

| Objective category/major objective | What | Why | How | Who |
|---|---|---|---|---|
| | Potential feasibility of a Butterfly garden to be assessed | A study undertaken shows that the region has a high diversity of butterflies. With the provision of the preferred food sources (i.e. indigenous flowers etc.), it is possible to create a butterfly park which could be marketed as part of LNR | Meeting with Mr Avuletey and Mr Niba from Walter Sisulu University to discuss Butterfly diversity and requirements for improving numbers of butterflies in the area<br>Landscape architect to be appointed to create butterfly garden including the planting of indigenous plant species preferred by butterflies<br>Butterfly garden to be managed by EC-DEDEAT or through PPP above and marketed together with LNR | DWS<br>EC-DEDEAT<br>ECPTA<br>DEA<br>KSDLM |
| | Development of community craft market linked to cultural village at the Dam | The Dam is located close to a number of per-urban settlements. Many people in the area are unemployed and the creation of a craft market could allow people in the community to obtain some income. It would also create a further attraction for tourists visiting the Dam | DWS to meet with EC-DEDEAT, ECPTA, DEA and KSDLM to discuss potential partnership and the possibility of appointing EC-DEDEAT as an IA.<br>Agreements to be drafted and signed<br>As part of PPP, a craft skills training programme should be developed and a craft market should be constructed near the public area | DWS<br>EC-DEDEAT<br>Public Operator<br>Community |
| | Potential for the creation of a Water sports stadium at the Dam to be determined | During consultation it was noted there was potential for a water sports stadium | The feasibility of creating a water sports stadium to be assessed | DWS<br>EC-DEDEAT<br>ECPTA<br>DEA<br>KSDLM<br>Dept of Sports |
| | Development of micro-enterprises and entrepreneurs. This could be linked to tourist initiatives in the area including cultural village and craft market, Nature Reserve, Nelson Mandela (i.e. walk in the footsteps of Mandela, links to Qunu) , Wild Coast Transkei, etc. | The local community around the Dam has a large number of unemployed people. Development of small business based on tourism in the region would provide an income. It would aid development of tourism in the area | It is suggested that the development of micro-enterprises be included in the Integrated Tourism Plan | DWS<br>EC-DEDEAT<br>ECPTA<br>DEA<br>KSDLM<br>Dept of Tourism |
| **Improved water quality and properly managed** | Discussions with the National Land Care programme to ensure eroded areas around the Dam are rehabilitated | There are a large number of dongas and gullies in the catchment and around the Dam. This results in increased turbidity at the Dam | Discussions with the National LandCare Programme to take place<br>Rehabilitation of eroded area | DWS<br>National Land Care Programme |

| Objective category/major objective | What | Why | How | Who |
|---|---|---|---|---|
| **natural resources** | | | | EC-DEDEAT |
| | Specialist studies including, flora, fauna, avifauna, fish, palaeontology and archaeology etc. to understand the natural resources around the Dam and in the nature reserve. The information from these studies can be used to ensure sustainable development and for marketing of the Dam | There are very few studies regarding the biodiversity of Mthatha Dam and LNR available. This information is required to ensure sustainable development and also for marketing of the Dam<br>The Dam also occurs in an area with high levels of paleontological resources as well as archaeological resources. Studies to identify and understand these resources are important | Flora, Fauna, Avifauna, Fish, Palaeontology, Archaeology and Invertebrate specialists to be appointed<br>Specialist studies to be compiled | DWS<br>EC-DEDEAT |
| | LNR to be proclaimed as a provincial nature reserve | The extent of LNR and the status of the reserve appear unclear. At this point it appears the reserve is not proclaimed. | EC-DEDEAT to determine extent of LNR boundary<br>LNR to be proclaimed as a provincial reserve | EC-DEDEAT<br>ECPTA |
| | Population Assessment of the Stanley Bustard (*Neotis denhami*) | The Stanley Bustard (*Neotis denhami*) is listed as vulnerable. Breeding pairs are known to occur in LNR. A population assessment should be undertaken to determine the health of the species | Avifauna specialist to be appointed and population assessment to be undertaken | EC-DEDEAT |
| | Species management plan for Alien invasive fish species | The Alien and Invasive Species Regulations require the development and coordination of Species Management Programmes for all Invasive Species listed in Category 1B. Both bass and carp occur at the Dam | A Species Management Plan should be compiled in line with the Alien Invasive Species Regulations | EC-DEDEAT<br>DEA<br>DWS |
| | Implementation of a wash bay to prevent Invasive Aquatic Plants | Water Hyacinth is known to occur on the river and in the catchment. A wash bay is required to prevent an infestations | Wash Bay to be constructed on State Land<br>Agreements regarding management of Wash bay to signed with DWS and DEA | DWS<br>DEA<br>CISWP |

| Objective category/major objective | What | Why | How | Who |
|---|---|---|---|---|
| | Survey of the Dam to identify any Invasive Aquatic Plants and if necessary control and management of Invasive Aquatic Plants | Water Hyacinth occurs on the Mthatha River however whether it occurs on the Dam is not known. The water quality at the Dam is poor and infestations are likely. It also not known if any other aquatic invasive species occur on the Dam | DEA to undertake site visit to determine presence of invasive species at the Dam<br>If necessary a survey of the extent of the infestation to be undertaken<br>A management plan to prevent further spread and to control the current infestation to be developed and implemented | EC-DEDEAT<br>DEA |
| | Pollution point study to be undertaken to identify main sources of pollution at the Dam | Water quality is a serious issue at the Dam and along Mthata River. The exact source of the pollution is not known and therefore at this point it is difficult to control or manage the pollution sources. | A water quality specialist should be appointed to undertake pollution study<br>Based on the results, the DMC should meet with polluters and discuss measures to improve water quality | DWS<br>DMC |
| | Upgrade of the Elangeni WWTWs | During consultation it was noted that the Elengeni WWTWs is currently operating above its design capacity. This has the potential to negatively impact water quality | The WWTW should be upgraded | DWS<br>KSDLM |
| | Water quality monitoring to be linked to the UPN System to allow quick response | Water quality is an issue at the Dam. In the past this has led to Algal blooms which impacts the domestic use of the Dam. Water quality monitoring is undertaken however by linking this to the UPN system it may be possible for efficient response. | Discussions with CIWSP to determine the potential for water quality monitoring by DWS to linked to the UPN System | DWS<br>DMC<br>CISWP |
| | DWS Water Quality Monitoring Department to ensure relevant personal undergo skippers license training and water quality monitoring to be undertaken from various points around the Dam | The water quality monitoring unity has a boat but there is no trained skipper and thus sampling is limited to the shoreline | Relevant personnel to undergo training<br>Water quality monitoring to be undertaken at various points | DWS |
| | Shoreline management plan to be compiled and implemented in conjunction with the community and stakeholders such as DEA, ECPTA, KSDLM and EC-DEDEAT. This plan should have a strong focus on erosion and silt management as well as management of grazing and should be developed in conjunction with DAFF. This | There is no formal management of the shoreline of Mthatha Dam taking into account all stakeholders. Issues such as erosion, overgrazing etc. need to be addressed. | Shoreline management plan to be compiled | DWS<br>DAFF<br>EC-DEDEAT<br>DEA |

| Objective category/major objective | What | Why | How | Who |
|---|---|---|---|---|
| | plan should also provide guidance on acceptable areas for activities such as quad biking. | | | |
| | Education programmes regarding the impacts of alien invasive species to be instituted | There are a number of alien invasive terrestrial and aquatic plant species in the QDS around the Dam. There are also a number of alien fish species at the Dam. An education programme regarding the impacts of these species should be compiled so to ensure better containment and management | Working for Water should compile information brochures regarding the invasive species at the Dam These should be made available at the Wash Bay Information boards with the information should be put in place at the Wash bay | DEA EC-DEDEAT DMC |
| **Improved access and services** | The potential feasibility for a ferry system to link communities on either side of the Dam to be determined. The study should assess safety, potential locations and linkages to existing roads. Discussions with KSDLM should also take place | There are a number of communities around the Dam which are isolated from each other due to Dam. A ferry system would enable easy access | Discussions with local community to discuss ferry system including site visit to confirm potential ferry sites included in the zonal map<br>Discussions with KSDLM regarding potential road linkages to the ferry system<br>Feasibility of ferry system to be undertaken taking into account discussions and site visit | DWS EC-DEDEAT KSDLM Local community |
| | The potential feasibility for the relocation of the bridge to be determined | The closest bridge available to allow access between communities is just downstream of the spillway and is in bad condition. This is a safety risk. It also allows access to the spillway | DWS to meet with KSDLM to discuss potential for moving the bridge<br>KSDLM to include bridge upgrade in their planning | DWS KSDLM |
| | The upgrade of the Rosedale Water Purification Plant to improve water supply to communities | During public participation it was noted that there are often water disruptions | The Water Purification Plan should be upgraded to ensue continuous service | DWS KSDLM |
| **Community skills development, awareness and training** | Lifeguard skills training and first aid training to ensure safe public use of the Dam | There is high level of unemployment in the area. Skills training will provide community members with skills and will improve safety at the Dam. | Feasibility of a "Working for Dams' Project including funding for skills training and job creation to be determined<br>Local community members to be trained | DWS DMC |
| | Awareness campaign to be developed by the DMC. The campaign should focus on potential uses of the Dam, the importance of infrastructure (to ensure no vandalism), Dam safety and the Dangers of swimming across the Dam | The community is not aware of the dangers of the spillway, safety risks regarding drowning or potential uses of the Dam | DMC to develop awareness programme<br>Awareness programme to be rolled out at churches and schools | DMC |

| Objective category/major objective | What | Why | How | Who |
|---|---|---|---|---|
| | An education programme to be developed by the Department of Health regarding safe use of raw water for domestic purposes | The community around the Dam often has water shortages and therefore use water from the Dam for domestic purposes. During the public meeting it was mentioned that this water is not boiled or prepared. The water quality in the Dam is poor especially in terms of E.coli numbers and this is a health risk | The DMC to liaise with the Department of Health, the Local and District Municipalities regarding the potential risks of the community drinking untreated water<br>The Department of Health to develop an education programme for the communities around the Dam to ensure that the community understand the importance of treating the raw water | DMC<br>Department of Health |
| | Discussions between local schools and universities regarding the potential for using the Dam as part of education programmes | The Dam has unique flora, fauna, archaeological and paleontological resources. This offers opportunities for community education programmes whereby local schools and universities access the Dam for education purposes | DWS to facilitate discussions with local schools EC-DEDEAT and SAHRA to develop education material | DWS<br>EC-DEDEAT<br>SAHRA |

# 5 WAY FORWARD

## 5.1 Compilation of Business Plans

Based on the strategic objectives identified for Mthatha Dam, a suite of BPs were developed. The BP describes the financial management and operational requirements to implement the Objectives of the RMP. The Financial Plan will facilitate the implementation of listed and recommended activities in the RMP.

The Business Plans are approached in the following manner:

- Identify Strategic Objective – informed by RMP;
- Determine Interventions – Each objective was divided into practical interventions;
- List Detailed Activities – Interventions were further divided into activities, in order to establish timeframes and provide guidance to the entity who implements the business plan;
- Establish Key Performance Indicators per intervention – Key Performance Indicators allow for monitoring and evaluation;
- Establish timeframes per activity;
- Establish a budget per activity; and
- Determine Funding sources – Innovative mechanisms to obtain funding were identified.

## 5.2 Review of RMPs and Business Plans

The RMP presents a twenty-year vision for the Dam. This vision will be implemented through the RMP which will be revised and updated every five years, according to changing priorities, constraints and achievements. Within a five-year cycle of the RMP, the BPs will identify key objectives in line with a changing status quo and potential change in circumstances. After five years the RMP will be reviewed and updated so to identify new objectives in line with the vision for the Dam.

The BPs are updated annually.

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