Department of Water and Sanitation

NATIONAL WATER RESOURCE INFRASTRUCTURE (NWRI)

Resource Management Plan
SETUMO DAM

REPORT – Volume 4 of 5

August 2017

WATER IS LIFE - SANITATION IS DIGNITY

water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

2030 NDP

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ACKNOWLEDGEMENTS

Engineerex (Pty) Ltd would like to express its gratitude to the following Stakeholders that immensely contributed in the development of this Resource Management Plan for Setumo Dam:

- Department of Arts and Culture;
- Department of Tourism;
- Mahikeng Local Municipality;
- Mmabatho Waste Water Treatment Plant (WWTP);
- Mmabatho's Premiers Office;
- North West Department of Rural , Environmental and Agricultural Development(READ);
- Sedibeng Water;
- The community members of Ga-Isreal and Tontonyane; and
- Traditional Council-Barolo Boo Ratshidi.

Acknowledgement is also extended to all other Stakeholders who attended and participated in the Stakeholder engagements.

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Review Period	Month	Year				
Annual Review of Business Plan	December	2019[1]	2020	2021	2022	2023
Five (5) Yearly Review of RMP	December	2023				

[1] The implementation of RMP and BP requires a year budget planning prior to operationalization.

AMENDMENTS PAGE

Revision No	Description	Date
1	Draft RMP for DWS Review	21/11/2016
2	Draft RMP for Public Review	23/03/2017
3	Final Draft RMP for DWS Review	30/05/2017
4	Final RMP for DWS Approval	26/07/2017
5	Final RMP for DWS Sign off	16/08/2017

LIST OF ACRONYMS

ADU	Avian Demographic Unit
Ato**N**	Aid(s) to Navigation
AGIS	Agriculture Geo-Referenced Information System
BP	Business Plan
CATHSSETA	Culture, Arts, Tourism, Hospitality, Sport Sector, Education and Training Authority
CIWSP	Co-operative Inland Waterways Safety Programme
CPSI	Centre of Public Service Innovation
CoGTA	Department of Corporative Governance and Traditional Affairs
CPSI	Centre for Public Service Innovation
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DPW	Department of Public Works
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EMF	Environmental Management Framework
FSL	Full Supply Level
GIAMA	Government Immovable Asset Management Act
GP	Guideline Program
GPS	Global Positioning System
GWWs	Government Waterworks
I&APs	Interested and Affected Parties
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IDP	Integrated Development Plan
IEE	Integrated Environmental Engineering
IRMP	Integrated Resource Management Plan
KPA	Key Performance Area
LED	Local Economic Development
MAT	Mean Annual Temperature
MLM	Mahikeng Local Municipality
NEMA	National Environment Management Act
NEMPAA	National Environmental Management: Protected Areas Act
NMMDM	Ngaka Modiri Molema District Municipality
NT	National Treasury
NWA	National Water Act
OMC	Operations Management Committee
OP	Policy Program
PP	Public Participation Process
PPP	Public Private Partnership
PSP	Professional Service Provider
QDS	Quarter Degree Square
RFP	Rural Fisheries Programme
READ	Department of Rural, Environmental and Agricultural Development
RMP	Resource Management Plan
SAMSA	South African Maritime Safety Authority

SAPS	South African Police Service
SASCOC	South African Sports Confederation and Olympic Committee
SDF	Spatial Development Framework
SWOT	Strengths, Weaknesses, Opportunities and Threats
WfW	Working for Water
WTWs	Water Treatment Works
WWWTs	Wastewater Treatment Works

EXECUTIVE SUMMARY

Mandate: The Department of Water and Sanitation (DWS), through the National Water Act, 1998 (Act No. 36 of 1998), is mandated to protect aquatic and associated ecosystems and their biological diversity. The Minister of Water and Sanitation, as the custodian of the nation's water resources must ensure that the Government Waterworks (GWWs), including Lotlamoreng Dam, are protected, used, developed, managed and controlled in a sustainable manner, for the benefit of all. To assist the Minister in attaining the mandate, and to ensure that access to, and use of the dam is equitable, the DWS initiated and commissioned the development of the Resource Management Plan (RMP) for Setumo Dam.

Purpose of RMP: The RMP is a plan which aims to regulate access and the recreational utilisation of a water resource and the surrounding state land, in ways which promote community participation and beneficiation, environmental conservation and unlock socio-economic potential of the water resource.

According to DWAF (2006), the use and management of the GWWs for recreation purpose needs to be based on Integrated Resource Management Plan (IRMP) included within the RMP.

Location of the Dam: Setumo Dam is an earth-fill type of a dam with uncontrolled ogee spillway and horseshoe shaped side channel. The dam impounds Molopo River and approximately 50% of the water entering the dam is treated wastewater effluent from Mahikeng Wastewater Treatment Plant. The dam falls under ward 12 of Mahikeng Local Municipality (MLM) within Ngaka Modiri District municipality in North West Province, South Africa. Its GPS coordinates are **25°51'34.31"S 25°31'13.29"E**

Purpose of the dam: The primary purpose of Setumo Dam is to provide domestic water. There are currently no recreational activities at the dam.

Dam ownership and management: Setumo Dam is owned by DWS. There is one (1) public access point next to the dam wall the dam is not fenced and this provide an opportunity for illegal fishers and sand miners to access the area.

There is currently no institutional structure to manage the proposed recreational use of the dam. However, the structure has been proposed in the RMP. The recreational institutional structure is necessary for the effective management of the Setumo Dam for recreational purposes.

Stakeholder engagement: The success of the development and implementation of the RMP depends on the role players and their level of participation. It is thus recognized that different roles and responsibilities of the stakeholders [Authorities and Interested and Affected Parties (I&APs)], their relationship towards each other and the steps in the planning procedure are imperative in the successful development of the RMP. As such, proper consultation with the public was done in order to help in producing a credible RMP.

DWAF's Guidelines for Public Participation (2001) outlines three (3) broad phases for public participation namely the **Planning, Participation** and **Exit phase**.

During the **Planning phase** a site inspection was conducted and literature reviewed in order to gather baseline information about the dam. A process was also established to get into contact with the I&APs and relevant authorities to ensure co-operative interests and support in the RMP project.

The **Participation phase** entailed three (3) important aspects, namely:

- Informing stakeholders about the RMP project;
- Meeting the stakeholders to present the RMP process; and
- Giving Feedback in the form of meeting minutes, follow-up emails, telephonic and direct communication.

During the **Exit phase**, a draft RMP was presented to the stakeholders for comment and inputs. The Exit phase entailed two (2) important aspects, namely:

- Ensuring that all goals, challenges, concerns, objectives and the vision of the dam are identified and documented in the RMP; and
- Officially ending the public participation process.

Identified objectives and vision: During the Authority and Public Meetings issues of concerns were raised from which common objectives were identified and a vision for the dam for a period of 20 years was formulated by the stakeholders.

The identified key common objectives are:

- To determine the purchased boundary as well as associated lines (buffer line and 1:100 year floodline) of proper planning around the dam;
- To ensure that all activities undertaken within the dam are permitted by DWS and conducted in accordance with the relevant legislation and policies;
- To remove the alien invasive species at the dam;
- To improve and maintain acceptable water quality in the dam;
- To compile a Zoning Plan for the dam;
- To ensure safety during recreational use of the dam;
- To provide adequate public access for recreational use of the water resource and its associated State Land through controlled authorised access and associated infrastructure development;
- To promote sustainable harvesting of fish;
- To ensure that local communities participate and benefit in potential local development initiatives around the dam;
- To establish capacity building and training within the local communities; and
- To ensure that a suitable and efficient institutional structure are in place to effectively manage the recreational utilization of dam

A vision for the dam, for a period of 20 years, was formulated by stakeholders to be as follows:

"A commitment to protect, manage, control and utilize the resource in a sustainable, equitable and effective manner in order to maximise the recreation potential of the dam and also to ensure that the use of the dam is beneficial to the local communities".

The aforementioned objectives and vision are aimed at supporting the attainment of DWS's vision, mission and objectives.

Tourism Potential: The following were identified as some of the potential recreational developments at the Setumo Dam that could enhance tourist attraction:

- Introduction of aquaculture;
- Introduction of selling stalls of artefacts of the Botswana culture at the entrance of the dam.
- Building of braaing facilities and day visitor's area.

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CHAPTER 1: INTRODUCTION

1.1 BACKGROUND OF SETUMO DAM

Setumo Dam is an earth fill type with uncontrolled ogee spillway and a horseshoe shaped side channel which impounds Molopo River. It falls under ward 14 of Mafikeng Local Municipality (MLM) which forms part of Ngaka Modiri Molema District Municipality (NMMDM) in the North-West Province, South Africa. Its Global Positioning System (GPS) co-ordinates are **25°51'34.31"S** and **25°31'13.29''E** (Refer to **Figure 1** for Locality Map)**.**

The dam lies within the D41A quaternary drainage of Upper Molopo Sub Management Area which forms part of Crocodile West Marico Catchment Management.

The dam was constructed in 1996 mainly for domestic water supply purpose. The dam is also used for livestock watering.

There are illegal activities taking place at the dam which are sand mining and fishing: these require corrective measures for the benefit of all. A recreational institutional structure needs to be put in place to oversee related activities at the dam. **Table 1** illustrates the dam profile.

Table 1: Setumo Dam Profile

Setumo Dam Profile	
Location	Located south-west of Mahikeng in North West province
District Municipality	Ngaka Modiri Molema District Municipality
Local municipality	Mahikeng Local Municipality
Ward	12
Water Management Area	3
GPS Coordinates	25°51'34.31"S 25°31'13.29"E
Quaternary Drainage Area	D41A
Completion date	1997
River or Watercourse	Molopo River
Wall height (m)	19
Crest Length (m)	1600
Capacity (1000 m^3)	19600
Surface area (ha)	447.3
Catchment area (km^2)	2257
Primary Purpose	Domestic: Water Supply
Owner Name	Department of Water and Sanitation

Source: Department of Water Affairs (List of registered dams; March 2013)

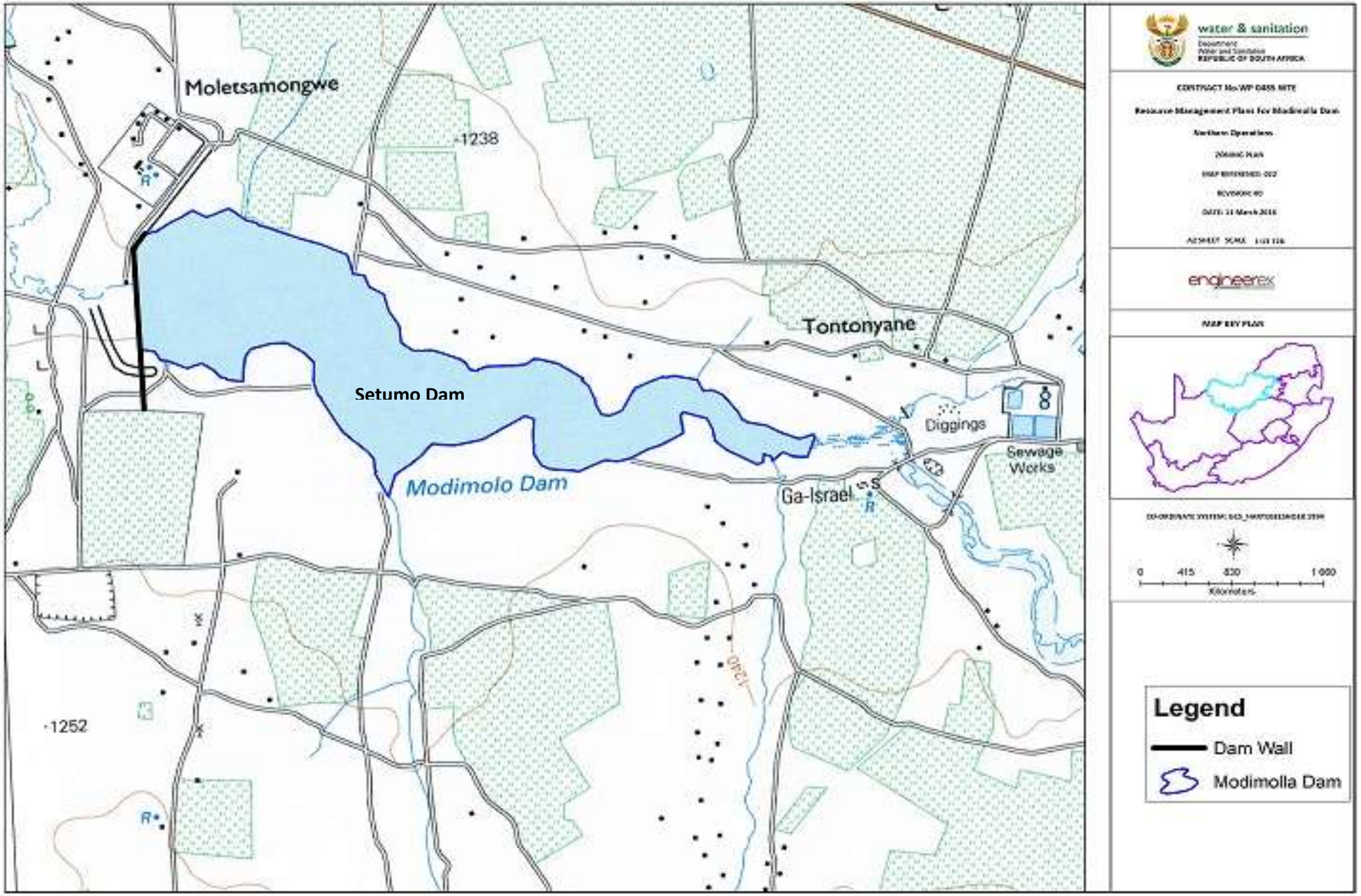

Figure 1: Locality Map for Setumo Dam

1.2 BIOPHYSICAL ENVIRONMENT

1.2.1 Climate

The Setumo Dam is situated in an area characterised by local steppe climate. This location is classified as BSh (hot semi-arid climates).

The annual temperature around the area averages 17.5 °C. Mean annual maximum and minimum temperatures for the area is 23.7°C and – 11.3 °C for January and June respectively (Climate Data.org, 2016)

The dam is situated within a summer rainfall area, with very dry winters (Mucina & Rutherford, 2006). The area's Mean Annual rainfall ranges from 2 mm to 108 mm. (Refer to **Figure 2** for the monthly average temperatures and rainfall).

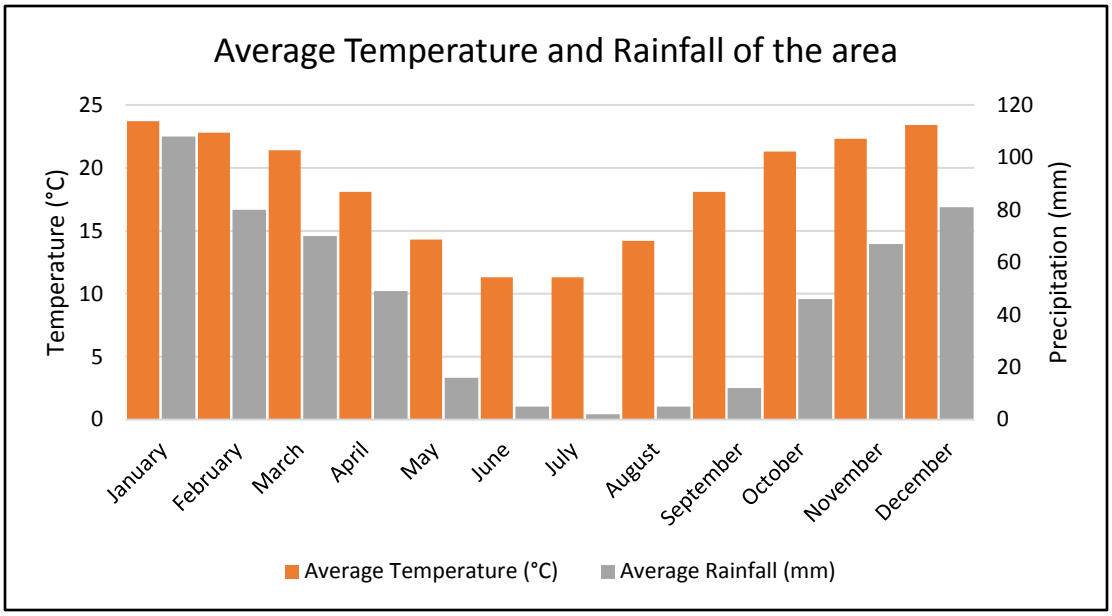

Figure 2: Average temperature and rainfall of the area (Climate Data.org, 2016)

1.2.2 Flora

According to Mucina & Rutherford (2006), the dam is located within Mahikeng Bushveld (SVK1). It is characterised by developed tree and shrub layers, dense stands of *Terminalia sericea, Acacia luederitzii* and *A. erioloba* in certain areas. The important vegetation occurring in the area includes *Acacia karoo, Acacia eroloba, grewia flava, rhus tenuinervis, ledebouria marginata,* etc (Mucina & Rutherford, 2006).The circled area on **Figure 3** represent the dam and Mahikeng Bushveld (SVK1).

Figure 3: Vegetation map of the Mahikeng Bushveld area (BIS, 2016)

Figure 4: Picture illustrating vegetation around the Dam

Mahikeng Bushveld is classified as vulnerable ecosystem. Department of Environmental Affairs (DEA, 2011) define vulnerable ecosystems as being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems. According to Department of Environmental Affairs (DEA, 2011), there are four main types of implications of listing an ecosystem:

- Planning related implications, linked to the requirement in the National Environmental Management Biodiversity Act, 2004 (Act No.107 of 2004) (NEMBA) for listed ecosystems to be taken into account in Municipal IDP and SDF;
- Environmental authorisation implications, in terms of National Environmental Management Act (Act No. 107 of 1998) (NEMA) and Environmental Impact Assessments (EIA) regulations;
- Proactive management implications, in terms of the NEMBA and
- Monitoring and reporting implications, in terms of the NEMBA.

1.2.2.1 **Terrestrial Alien Vegetation**

Alien species were either intentionally or unintentionally introduced to South Africa. Some plants have been introduced with the intent of aesthetically improving public recreation areas or private properties, whilst others are introduced for ornamental or timber uses.

During the site inspection at, there following two (2) terrestrial Alien Plant Species were observed:

- *Argemone mexicana; and*
- *Nicotiana glauca.*

These terrestrial Alien Plant Species are both categorized in Category **1b.** According to Department of Environmental Affairs (2014), Category **1b** is for "any alien species that has been legally introduced into the Republic, or was introduced into the Republic prior to any legal requirement for such introduction, for agricultural purposes, and any new cultivar,

variety, or hybrid of any species legally imported for agricultural purposes".

Category 1b Invasive species requires a compulsory control as part of an invasive species control programme. They should be removed and destroyed. These plants are deemed to have such a high invasive potential that infestations can qualify to be placed under a government sponsored invasive species management programme (SANBI, 2016). No permits will be issued for these species.

1.2.3 Fauna

1.2.3.1 Frogs

According to the Frog map Atlas, three (3) species were found in the 2525DC Quarter Degree Square (QDS) (Avian Demography Unit (ADU) 2016.)

Table 2: Frog Species occurring in 2525DC QDS (ADU 2016)

Genus	Species	Common name	Red list category
Sclerophrys	*garmani*	Oliver Toad	Least Concern
Kassina	*senegalensis*	Bubbling Kassina	Least Concern
Cacosternum	*boettgeri*	Common Caco	Least Concern

1.2.3.2 Fish Species

An estimate of eight (8) fish species are expected to occur within Molopo River (Kotze, 2010). The presence of numerous flow dependent fish species as well as numerous slow flow dependent species indicate that a wide variety of habitats occur in the region. Refer to **Table 3** for the list:

Table 3: Fish species found within Molopo River (Source Kotze, 2012)

Genus	Species	Common name	Red list category[2]
Babeobarbus	*aeneus*	Smallmouth yellowfish	Least Concern
Barbus	*anoplus*	Chubbyhead Barb	Least Concern
	Pallidus	Goldie Barb	Least Concern
Barbus	*Paludinosus*	Straightfin Barb	Least Concern
Clarias	*gariepinus*	Common Catfish	Least Concern
Tilapia	*Sparrmanii*	Banded Tilapia	Least Concern
Micropterus	*salmoides*	Largemouth Bass	Invasive Species

According to Tapela *et al.,* (2015), in 2001, the Rural Fisheries Programme (RFP) conducted a biological survey at the dam. It was estimated that approximately seventy (70) fishers used to fish at the dam. The fishers used hand lines, rods and gill nets. This is an indication that fishing was an important part of their livelihoods strategy (Tapela *et al,* 2015). Most of the fishers sold their fish locally, but it is alleged that there was a Ghanaian businessman who would come regularly from Johannesburg and fill his car with fish for sale in Johannesburg.

The study was redone again in 2011. During this survey only about thirty (30) fishers were observed fishing, however, they indicated that it was only for local consumption. There was no indication that fish was being sold to an external person.

1.2.3.3 Reptiles

There were two (2) reptile species which were recorded within 2525DC QDS (ADU 2016), these species are listed as least concern (SARCA, 2014). Refer to **Table 4** for the list of the reptiles occurring in the area.

[2] The IUCN Red List of Threatened Species (2015-4)

Table 4: Reptile Species found within 2525 DC QDC (ADU)

Genus	Species	Common name	Red List category
Hemidactylus	*mabouia*	Common Tropical House Gecko	Least concern
Bitis	*arietans*	Puff Adder	Least concern

1.2.3.4 **Mammals**

Approximately fifty-four (54) mammal species were recorded within 2525DC QDS (ADU, 2016). These includes Vulnerable Species such as *Acinonyx jubatus* (Cheetah) and Near Threatened species such as *Atelerix frontalis* (Southern African Hedgehog), *Hyaena brunnea* (Brown Hyena) and *Mellivora capensis* (Honey Badger).

Figure 5: Picture illustrating Great Egret around the dam

1.2.4 Topography

According to Agricultural Geo-Reference System (AGIS) Map, the terrain of the area is described as level plains with some relief (Class A2) as illustrated in **Figure 6.** The elevation of the shoreline of the dam varies as follows:

- Minimum Elevation – 1218 m
- Average – 1233 m
- Maximum – 1239 m.

The general slope angle ranges average at 0.8%.

Figure 6: Elevation Slope and data of the study area (Google Earth 2016)

1.2.5 Geology and Soil

Setumo Dam is covered by Aeolian Kalahari sand of tertiary to recent age on flat sandy plains, soil deep (>1.2 m) (Mucina & Rutherford, 2006). One of the characteristics of Kalahari Sand is the possession of collapsible grains structure upon saturation which have been classified as severe trouble when building infrastructures as per Jennings Knight Table (Forbes Dick and Associate, 1994).

The soil types around Lotlamoreng Dam are described as red-yellow apedal, freely drained soils; red, high base status > 300 mm deep (no dunes) (AGIS, 2016). **Figure 7**.

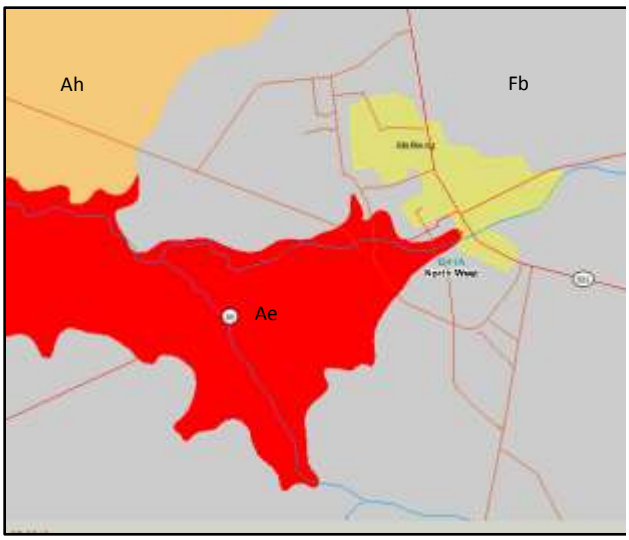

Figure 7: Map illustrating land types around the dam (AIGIS, 2016)

1.2.6 Hydrology

The dam is located within the Water Management Area (WMA) of The Crocodile (West) and Marico, in the Upper Molopo sub-WMA. The Crocodile (West) and WMA is defined by the following Catchments: Crocodile River, Marico River, South African portion of Ngotwane River and the Upper Molopo River (DWA, 2012). The area forms part of the Limpopo River basin, which spans the four (4) countries of Botswana, Zimbabwe, South Africa and Mozambique.

The WMA covers approximately 48 000 km^2 with the largest being the Crocodile River catchment (29 349 km^2) followed by the Marico River catchment (12 049 km^2). The remainder is covered by the Ngotwane River and Upper Molopo River catchments at approximately 5 000 km^2 and 1 800 km^2 respectively. The WMA includes the tertiary drainage regions: A10, A21 to A24, A31, A32 and quaternary drainage region D41A.

The Crocodile West and Marico WMA is one of the many water stressed catchments in South Africa (DWA, 2012). Surface water resources are used extensively, particularly in the Crocodile River catchment, with the main water users being agriculture, industry, mining and urban.

Economic activity in the water management area is dominated by the urban and industrial complexes of northern Johannesburg and Pretoria and platinum mining north-east of Rustenburg. It is the second most populous water management area in the country and has the largest proportionate contribution to the national economy (DWS, 2013).

Development and utilization of surface water occurring naturally in the WMA has reached its full potential. Large dolomitic groundwater aquifers occur along the southern part of the WMA, which is the reason for part of the Upper Molopo River catchment being incorporated into the area (DWAF, 2004). The aquifers are utilised extensively for urban and irrigation purposes. Localised over-exploitation of groundwater occurs in the Molopo area.

Increasing quantities of effluent return flow from urban and industrial areas offer considerable potential for re-use, but the effluent is at the same time a major cause of pollution in some rivers (DWA, 2012 & DWA, 2013).

Population and economic growth, centered on the Johannesburg-Pretoria metropolitan complex and mining developments, are expected to continue strongly in this area. Little change is foreseen in population and economic development in rural areas.

Some of the major dams found within this WMA includes Hartbeespoort, Molatedi and Roodekopjes.

1.2.6.1 **Surface Water**

The dam lies within the Upper Molopo Catchment area in Quaternary Drainage Area D41A as illustrated in **Figure 8** and it impounds the Molopo River. The dam has a full storage capacity of 540 000 M^3 with surface area of 35 Hectares (DWS, 2016).

Figure 8: The Crocodile West and Marico WMA (DWA, 2012)

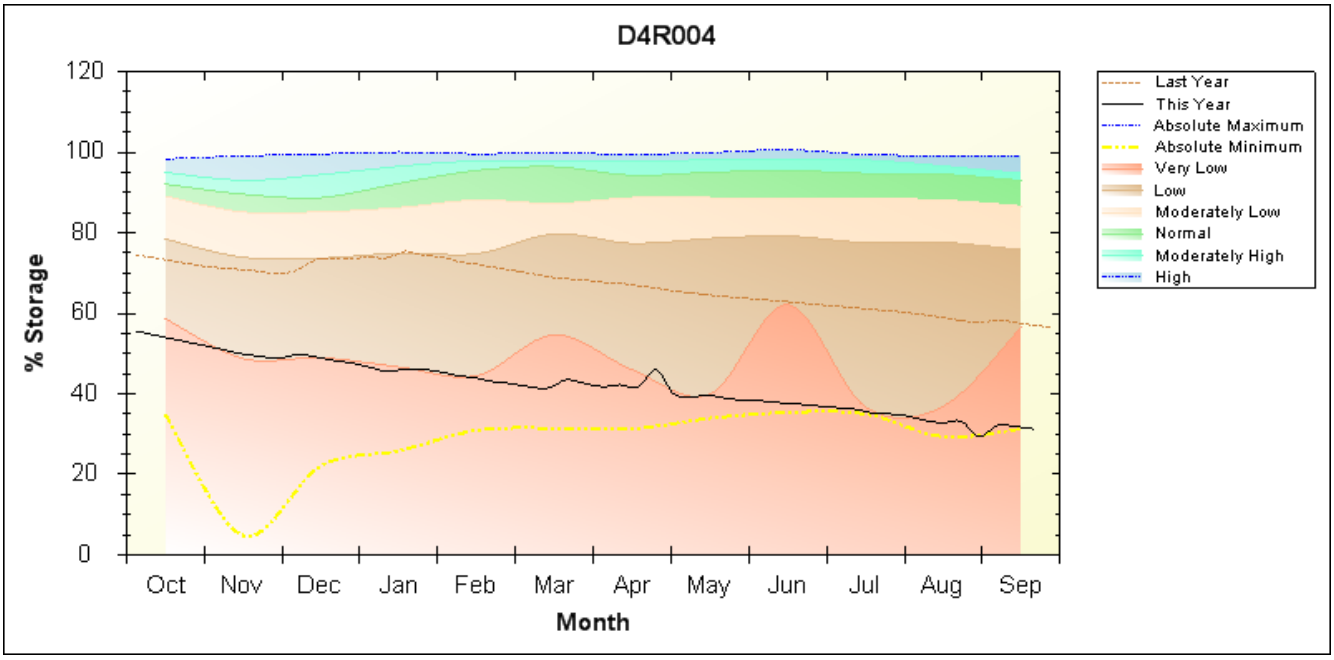

Figure 9: Water level fluctuation of over a period of one year (DWS, 2016)

1.2.6.2 **Water Quality**

The term water quality is used to describe the physical, chemical, biological and aesthetic properties of water, all of which determine its fitness for use and its ability to maintain the health of aquatic organisms (DWAF, 1996). Water quality therefore expresses the suitability of water to sustain various uses or processes. Any particular use will have certain requirements for the physical, chemical or biological characteristics of water. Water quality of the dam was one of the main concerns raised at both Stakeholder Meetings (Public and Authority). Specific concerns were raised regarding the sewage management on the adjacent Mmabatho waste water treatment plant.

The information used on **Table 5** was received from DWS: Resource Quality Information System (RQIS). The water monitoring was conducted in the months of 01/2015 to 07/2015 (monitoring site: WMS 101858 D4R004Q01).

Table 5: Water Quality variable (DWS, 2016)

Characteristics	Tests Results	Water Quality Target Range (Recreational Purposes)	Effects
pH (pH units)	9.099	6.5 – 8.5	No significant effects on health due to toxicity of Quality Range dissolved metal ions and protonated species, or on taste are expected. Slight metal solubility may occur at the extremes of this range.
Nitrates (NO_3 +NO_2)(mg/L)	0.05	NA	No health effects
Chloride (Cl) (mg/L)	101.15	NA	No health effects
Ammonia (NH_4)(mg/L)	0.05	NA	No health and or Aesthetic effects can occur.
Sulphate (SO_4) (mg/L)	30.327	NA	No health or aesthetic effects are experienced
Electrical Conductivity (mS/m)	88.3	NA	No health effects associated with electrical conductivity of the water.
Phosphate PO_4	0.01	NA	Oligotrophic conditions; usually moderate levels of species diversity; usually low productivity systems with rapid nutrient cycling; no nuisance growth of aquatic plants or blue-green algae.

From the above **Table 5** the following can be deduced:
The pH of the water is high and eye irritation can become increasingly severe as the values increase. According to South African Water Quality Guidelines (SAWQG 1996), pH greater than 9 has a risk of skin, ear and mucous membrane irritation. This only applies for intended full body contact. If recreational activities including swimming are proposed.

NB: The information provided on the above table was deduced from RQS (2016).Water quality analysis data was assessed for specific chemical parameters. The results of the test were only corresponding with domestic use rather than recreational use. Water quality standards which depict Not Applicable (NA) on the above table are only results for domestic use, and no studies have been done for water quality analysis of recreational use

1.3 USES AND USERS OF THE DAM

1.3.1 Primary Function of the Dam

1.3.1.1 Domestic Use

The dam was originally built for the purpose of domestic water supply. However it is used for livestock grazing, watering and illegal sand

mining. Approximately 50% of the water entering the dam is treated wastewater effluent from the Mahikeng Wastewater Treatment Plant.

1.3.1.2 Irrigation Use

The main land use types around the dam is agriculture.The dam provides irrigation water to majority of agricultural based activities within the area.

1.3.2 Secondary Use of the Dam

1.3.2.1 Recreational Use

There are two types of recreational activities that are currently taking place at and around the dam e.g:

- Picnicking and
- Fishing.

During the festive seasons, the community members engage in uncoordinated recreational activities .Although the dam is used for secondary activities there is no institutional structure to manage such activities.

1.4 RECREATIONAL INSTITUTIONAL STRUCTURE

There is currently no institutional structure that is managing recreational use of the dam.

1.4.1 Management of Water Surface

The management of the water surface in terms of operation of the dam is done by DWS.

In addition to DWS, Local Accountable AtoN Parties (LAAP) and other Bodies providing access to Government waterways and watercourses have a responsibility to ensure that the required fixed and/or floating AtoN are provided after obtaining the necessary support from DWS and thereafter the permission by SAMSA.

1.4.2 Access

There is one access entry situated opposite the Mmabatho Water Treatment works. There is no fence around the dam which may result to high crime activities, vandalism of DWS structures and illegal fishing as people can access the dam anywhere.

1.5 SAFETY

There is no fence surrounding the dam and this has led to illegal fishing, sand mining and dumping by Local Communities, this is due to lack of inadequate safety system in place at the dam .

1.5.1.1 Safety of Navigation

There is currently no adequate, standardised and harmonised fixed and floating Aids to Navigation[3] (AtoN) and Demarcation Markers in place.

1.5.1.2 Incident Management

There is no specific incident management system in place to ensure that incidents are responded to in a co-ordinated manner.

1.6 SOCIO-ECONOMIC ENVIRONMENT

1.6.1 Social Audit

The main purpose of social audit is to examine the general status of the study area and to determine issues that need to be addressed when developing the RMP in order to overcome potential difficulties in an area. The study area falls within Ward 12 of the MLM as shown in **Figure 10**. An understanding of socio-economic conditions of Ward 12 can be used at a later stage to determine the impact of a RMP in the area in terms of changed socio-economic conditions.

A social Audit which focused on the population composition of the ward, Education level and employment status was undertaken and is presented in section 1.6.1.1 to 1.6.1.4, respectively.

[3] A marine Aid to Navigation (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".

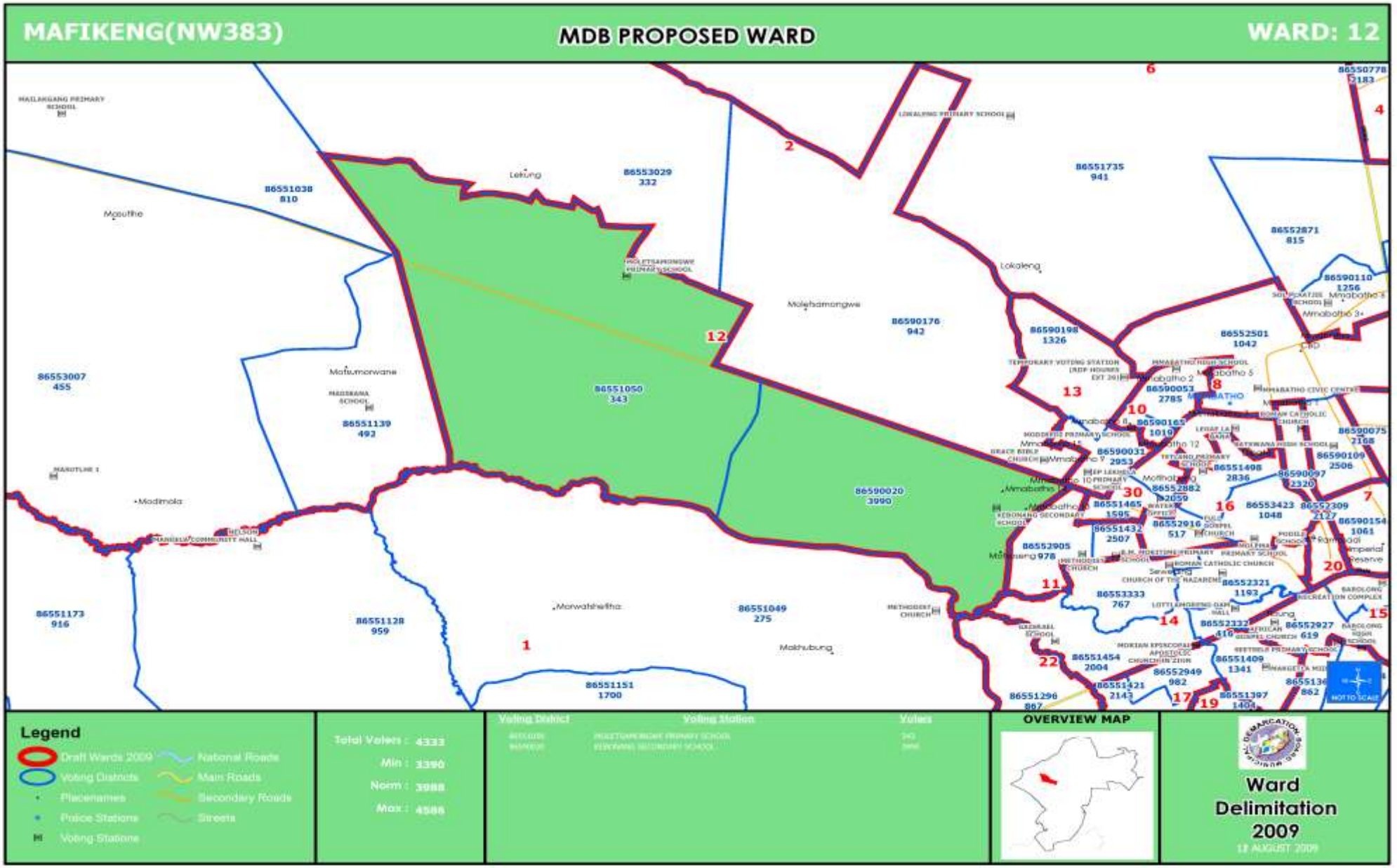

Figure 10: Mahikeng Local Municipality Ward 12

1.6.1.1 **Population Size**

According to the IDP (2015 - 2016), MLM has increased its population from 259 502 in 2001 to 291 527 in 2011. The current population comprises of 141 642 males and 149 885 females. Representing 51.4% and 48.6% respectively. Females outnumber males in a ratio of 1:1.06. The Young People between the ages of 0 – 14 (89 702 = 30.8%), Working Age (15 – 64) constituted (187 723 = 64.4%) and finally the elderly (65+) constituted (14 080 = 4.8%).

According to IDP (2015-2016), Ward 12 consists of 9 579 people of which 31.2% represent Youths (0 - 14), 67.0% represent Working Ages (15 - 64) and 1.9% represent Elderly (65+). In consistence with the whole municipality, the females 53.3%) outnumber the males (46.7%) in a ratio of 1:1.99.42% of the population within this ward are Black African. As shown in **Figure 11**, ward 12 constitutes only 3% of MLM population

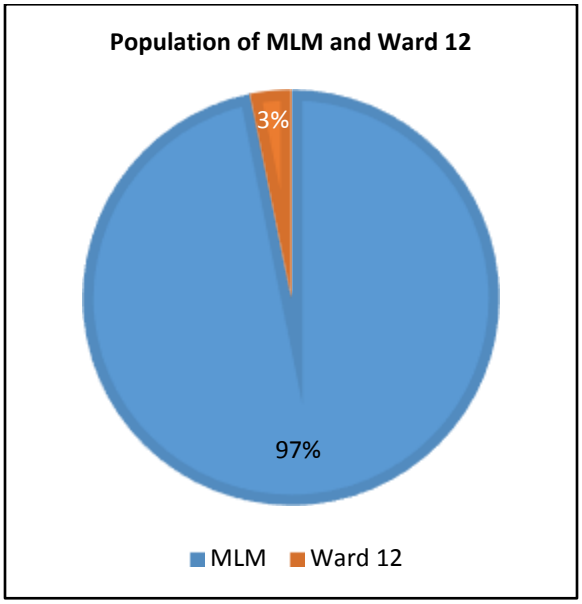

Figure 11: Population of Mahikeng Local municipality and Ward 12

1.6.1.2 **Education Level**

The Census (2011) breaks down educational levels into each year of study. For the purpose of this report, the educational levels are grouped into key schooling, higher education and no schooling categories. Educational data of Ward 12 could not be generated, as **Figure 12** only illustrates the overall educational level for MLM.

The **Figure 12** illustrates approximately 14.9% of the population within the MLM have completed Grade 12/Std 10. Poor educational level usually hampers the development prospects of an area. Furthermore, it is of concern to note that approximately 83.3% of the population within the MLM have not completed their secondary education.

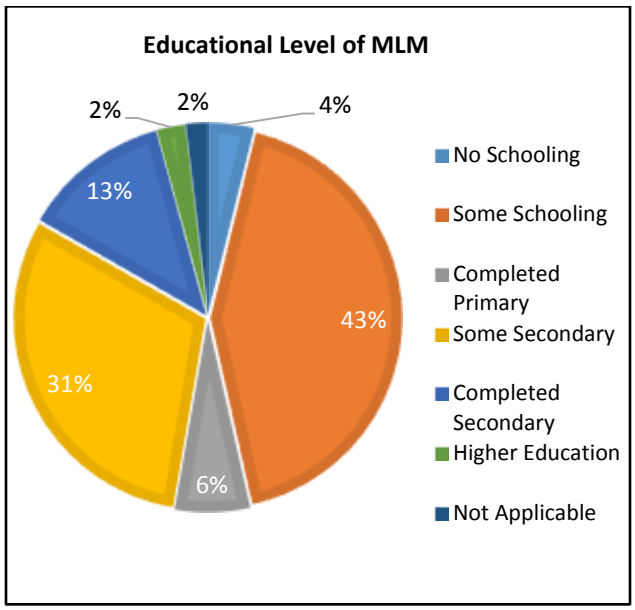

Figure 12: Educational level of MML

1.6.1.3 **Employment Status**

The municipality is predominantly rural and its economy is unable to provide individuals with remunerative jobs or self-employment opportunities. An estimated amount of about 13755 (4.72%) people in the municipality had no income in 2011. Taking the 1.16% annual growth rate to date this therefore means that to date the total number of people with no income has risen to about 14 405. In general terms, the majority of households in the municipality earns less than the poverty line (about R1, 600 per household per month) and can be considered poor.

Most of those classified as economically active are employed in the services sector. The major employer in this sector are the various government departments such as health, justice, local government, education, SAPS, etc. **Table 6** indicates the income categories within the municipality in comparison to the district and the province.

Concerted and integrated efforts by the municipality is required to create decent work and sustainable livelihoods for the people. It is also worth noting that only 0.2% of individuals earn above R50, 000 per annum within the municipality.

Table 6: Income level of the Provincial, Local and District Municipality.

Income Band	North West	Ngaka Modiri Molema	Mahikeng
No Income	176 090	34 587	14 405
R1 – R4800	44 720	1 135	4 223
R4801 – R 9600	76 068	21 338	7 525
R 9601 – R19 600	200 531	51 572	16 506
R19 601 – R 38 200	21 0842	48 975	15 338
R38 201 – R76 400	16 2965	24 052	9 368
R76 401 – R153 800	93 223	15 891	7 365
R153 801 – R307 600	56 610	11 416	5 827
R307 601 – R 614 400	28 028	5 360	2 987
R614 401 – R1 228 800	8 266	1 506	854
R1 228 801 – R 2457 600	2 629	516	257
R 2 457 601 - more	2 025	450	231

1.6.2 Gross Value Added

Gross Value Added (GVA) is defined as the total value of all the goods produced in a specified area during a specific period. Quantec Research classified the major sectors within the MLM into Primary sector which involves direct use of natural resources, Secondary sector involving manufacturing and Tertiary sectors, which comprises of services.

Figure 13 illustrates the NMMDM GVA per sector for 2014/2015 and shows that the greatest contribution for NMMDM is from Secondary and Tertiary sectors (Construction and Finance) whereas mining and community/social infrastructure are the lowest contributors to the economy of the district (NMMDM IDP 2014-2015).The variables are explained below:

Primary Sector:

- Agriculture; and
- Mining and Quarrying.

Secondary Sector:

- Manufacturing; and
- Construction.

Tertiary Sector:

- Trade;
- Transport and Communication;
- Tourism;
- Finance and Business Services; and

- Community, social and personal services.

The North West Province economy mainly receives its income from mining activities, which generate more than half of the province's gross domestic product and provides jobs for a quarter of its workforce.

The RMP for Setumo Dam can contribute to the growth of the Municipal economic sectors, and this can be in the form of fishing, finance, business services, catering and accommodation, transport, and communication.

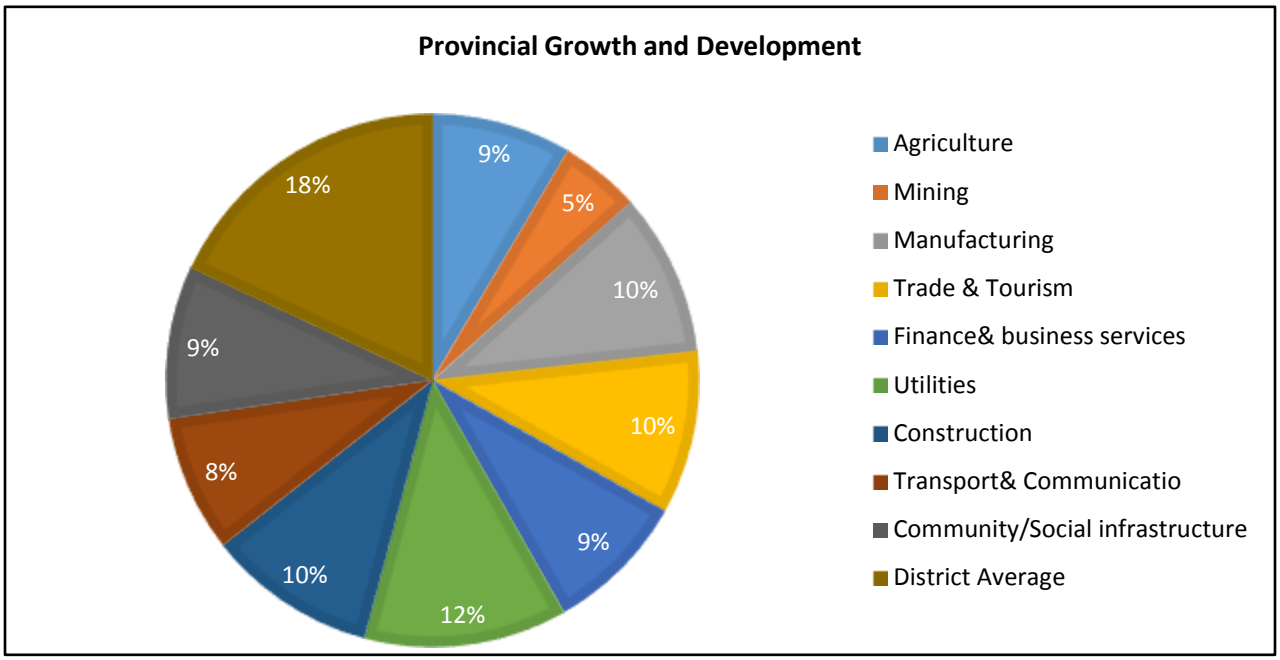

Figure 13: GVA for Setumo in 2013 (IDP 2014-2015)

1.6.3 Community Beneficiation

It is DWS's belief that Local Communities should equally share the benefits emanating from the utilisation of the dam for recreational purposes, by ensuring that they have both physical access to the resource, as well as access to the water-based recreation economy.

According to DWAF (2006), by ensuring that the Local Communities move beyond merely being affected by or living close to a water resource, but rather undertaking the transition to become participants will ensure that water resources can and will be protected by the people closest to and most affected by the dam.

The community will benefit in amongst others the following ways:

- By having equitable access to the dam;
- The community needs will be addressed in an appropriate and equitable manner;
- Safety when accessing and using the dam;
- By being given first preference when there are employment opportunities and skills development;
- Through the PPP; and
- By participating in decision-making with respect to planned developments for the dam (through the Dam Management Committee).

CHAPTER 2: LEGISLATIVE FRAMEWORK

The RMP forms the overarching framework for the management of Setumo 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.

I. **The Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996), Section 24**: Provides that, everyone has a right to an environment that is not harmful to their health or well-being**.**

II. **Conservation of Agricultural Resource Act, 1983 (Act No. 43 of 1983):** Provides for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith**.** Regulation 7 and 8 within the same Act deals with the protection of wetlands and water courses, while regulations 15 and 16 deals with Alien Invasive Plant Species and bush encroachment.

III. **Consideration on Institutional Arrangement for Managing Use of Water for Recreational Purposes (DWAF, 2003):** It outlines some of the institutional issues at a local level and makes recommendations about the conditions **under which different Institution** Management arrangements may be considered.

IV. **General Public Participation Guidelines (DWAF, 2001):** Public Participation refers to the ongoing interaction between Role Players and all stakeholders that is aimed at improving decision making during planning, design, implementation and evaluation of all projects within the state, this includes the proposed development of the RMP.

V. **Government Immovable Asset Management Act, 2007 (Act No. 19 of 2007):** To provide for a uniform framework for the management of an immovable asset that is held or used by a national or provincial department; to ensure the coordination of the use of an immovable asset with the service delivery objectives of a national or provincial department; to provide for issuing of guidelines and minimum standards in respect of immovable asset management by a national or provincial department; and to provide for matters incidental thereto.

VI. **Government Notice R654 dated 1 May 1964, in terms of the Water Act, 1956 (Act No. 54 of 1956):** Regulates access and use of government waterworks for recreational purposes.

VII. **Guidelines for Compilation of Resource Management Plans (DWAF, 2006):** It directs and guides the development of RMPs by providing insight into the purpose and objectives of these plans, the procedure for its compilation and structure of such documents.

VIII. **Merchant Shipping (National Small Vessel Safety) Regulations (2007):** These Regulations provide *inter alia* for:

- Requirements for vessel safety;
- Crewing requirements and responsibilities;
- Controlled events such as competitions and regattas; and
- Responsibilities of authorised agencies (governing

boards/clubs/organisations and regulating authorities).

These Regulations apply to the Department of Water and Sanitation as it is applicable to all inland and sheltered waters and as the Department and its agencies are allowing access to government waterworks for recreational boating vessels.

IX. **Methodology for Carrying Capacity Assessment for the Use of Water for Recreational Purposes (DWAF, 2003):** The carrying capacity of a water resource represents the maximum level of visitor/recreational use and related infrastructure that the water resource and surrounding area can accommodate, without diminishing user satisfaction or adverse impacts upon the local or host community, the economy and culture of the area.

X. **National Environmental Management Act, 1998 (Act No. 107 of 1998):** NEMA serves as South Africa's Environmental Framework Legislation. It was designed to provide for co-operative and Integrated Environmental Governance by establishing a general framework for decision-making on matters affecting the environment.

XI. **National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) and Related Regulations:** This Act aims to provide the framework, norms and standards for the conservation, sustainable use and equitable benefit-sharing of South Africa's biological resources.

The Alien and Invasive Species Regulations for this Act came into effect 01 October 2014. NEMBA together with these Regulations aim to prevent the introduction and spread of alien and invasive species across South Africa.

XII. **National Environmental Management: Protected Area Act, 2003 (Act No. 57 of 2003):** The aim of this Act is to provide for the protection and conservation of ecologically viable areas, which are representative of South Africa's Biodiversity, as well as natural landscapes and seascapes.

XIII. **National Treasury Public Private Partnership (PPP) Toolkit for Tourism, 2005:** This toolkit assist the process of development of tourism-based businesses on State-owned Land. The Toolkit make it easier for Institutions and the Private Sector to enter into tourism related partnerships on State Property managed by National and Provincial Government Institutions.

XIV. **National Water Act, 1998 (Act No. 36 of 1998):** The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and appropriate manner, for the benefit of all. Furthermore Section 113 of the Act states that the water of a government waterworks and surrounding state owned land may be made available for recreational purposes, subject to controls determined by the Minister and regulations made by the Minister.

Using water for recreational purposes is a water use under Section 21K and can be exercised as permissible use of water under Schedule 1 of the Act. However, this provision does not cater for commercial use hence the RMP should be implemented in line with General Strategic Plan for commercialisation of Tourism Public Private Partnerships at

Government Waterworks, 2009 and PFMA Treasury Regulation 16.

Once the RMP has been approved, 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.

XV. **Operational Policy: Using Water for Recreational Purposes (DWAF, 2004):** This policy is the main guideline in support of the RMP process with regards to the basic principles, policies, strategies and actions for regulating the use of water for recreational purposes.

XVI. **Public Finance Management Act (PFMA) (Act No. 29 of 1999**): Section 76 of the Act secures 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 PPP agreements with the private sector for the commercial use of state assets.

XVII. **Safety at Sport and Recreational Events Act, 2010 (Act No. 2 of 2010):** Events management is addressed by Safety at Sport and Recreational Events Act (Act No. 2 of 2010). This act deals with ensuring responsibility for safety and security at events. The act deals with among other things,

- Responsibility for safety and security at the events;
- Risk categorization of events; and
- Safety certificates.

XVIII. **South African Maritime Safety Authority Act, 1998 (Act No. 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.

XIX. **Water Services Act (Act No. 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 RMP process also takes cognizance of the following Legislations, Policies, Programmes and Reports:

- Broad-based Black Economic Empowerment Act, 2003 (Act No. 53 of 2003).
- Communal Land Rights Act, 2004 (Act No.11 of 2004).
- Development Facilitation Act, 1995 (Act No. 67 of 1995).
- Disaster Management Act, 2002 (Act No. 57 of 2002).Draft Local Economic Development Strategy of SLM (2012).
- Integrated Waste Management Plan, 2011
- Integrated Development Plan of NMMDM (2014/2015).
- Intergovernmental Relations Framework Act, 2005 (Act No.13 of 2005).
- Land Administration Act, 1995 (Act No. 2 of 1995).
- Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000).
- National Heritage Resources Act, 1999 (No. 25 of 1999).
- Occupation Health and Safety Act, 1993 (Act No. 85 of 1993).
- Restitution of Land Rights Act, 1994 (Act No. 22 of 1994).
- Spatial Development Framework Revision and Urban Edge determination for SLM (2007).
- State Land Disposal Act, 1961 (Act No. 48 of 1961).

- **Safety of Navigation:** In addition to its common law responsibility, DWS is, in terms of the requirements described in the National Water Act, Act No 36 of 1998, amongst others, responsible for the safety of GWWs. DWS, its delegated public sector partner, or a delegated water management institution, has therefore the responsibility to provide the required fixed and/or floating AtoN for general navigation.In addition to the DWS, Local Accountable AtoN Parties (LAAP) and other Bodies providing access to Government waterways and watercourses have a responsibility to ensure that the required fixed and/or floating AtoN are provided after obtaining the necessary support from DWS and thereafter the permission by SAMSA. In order to demarcate specific zones/areas, standardised demarcation markers are to be used in conjunction with the relevant AtoN.

- 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.
  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.Not only do these Acts, Regulations and Frameworks guide specific decisions and actions, they also provide the framework for monitoring performance and compliance, and provide guidelines regarding contravention, offences and penalties. This list is not extensive, other legislation could be applicable.

CHAPTER 3: WHAT IS A RESOURCE MANAGEMENT PLAN

3.1 DEFINITION OF A RMP

A RMP is a tool which provide guidance on how the dam can be utilised and managed for recreational purposes, in ways which promote community participation and beneficiation, environmental conservation and to unlock socio-economic potential of the water resource for recreational use.

Recreational use includes activities ranging from leisure, sport to culture and religion. Although recreational use does not involve water consumption, it is still a major water use and needs to be managed correctly to ensure increased community participation and beneficiation with minimal disturbances and environmental impacts.

3.2 PURPOSE OF RMP

The main aim of RMPs is to attain the objectives underlying sustainability and to compile functional, workable sustainable access and utilization plans for water resources. Without approved management plans related to the utilization of the water resource in place, it makes it difficult for informed decisions to be made, necessitating a precautionary approach to access, utilization and development of the water resource.

One of the components of the RMP process is to implement an Institutional Plan for effective management of GWWs. The focus on the Institutional Plan is accompanied by a Zoning Plan which is influenced by current and potential recreational uses The RMP also outlines the Strategic Plan for all the identified objectives for the dam. In addition, a Financial Plan is incorporated into the Business Plan (BP) and provides guidance on funding requirements and funding options to implement the potential recreational activities at the dam.

3.3 PROCESS TRIGGERS

Triggers are factors that have encouraged DWS to initiate and commission the development of RMPs.

A number of generic factors have been identified by DWS for the development of RMPs, however, the Process Facilitator identified site specific trigger factors for Setumo Dam, as illustrated in **Table 7**.

Table 7: Trigger Factors for the Development of Setumo Dam RMP

Trigger Factors	Description
Resource Management	**Aquatic Alien Invasive Plant species:** • Setumo Dam is infested with Aquatic Alien Invasive Plant Species such as *Argemone Mexicana* and *Nicotiana Glauca*. The *Nicotiana Glauca* grows rapidly and displaces indigenous vegetation. It also has a negative effect on the alteration of the ecological condition e.g. light, nutrients and water availability. The *Argemone Mexicana* can also be toxic to cattle's grazing. **Water Quality** • The water quality in the dam is poor. There is presence of excessive algae, debris and this might be attributed to treated waste effluent. Flies in the dam might be attributed to decomposition of algae or debris.

Trigger Factors	Description
Resource Utilisation	**Illegal Sand mining** • There is illegal sand mining taking place at the dam. Educating the community on procedures to follow in order to obtain mining authorisations/ permits from Department of Minerals Resources (DMR) is important.
Community Participation and Beneficiation	**Community Participation and Beneficiation** • The previously disadvantaged local communities are experiencing problems with regards to physical access as well as access to water-based economy of the resource. • The dam is mainly used for livestock grazing rather than recreational activities. There is a need to promote the dam for recreational activities.
Public Policy	**Local Planning Initiatives** • The Setumo Dam should be integrated in other local planning initiatives and decision support tools such as the MLM Integrated Development Plan (IDP), Spatial Development Framework (SDF) and Local Economic Development (LED).

3.4 RMP DEVELOPMENT PROCESS

The RMP is developed in accordance to the RMP Guideline Procedure (DWAF, 2006) as illustrated **Figure 14.**

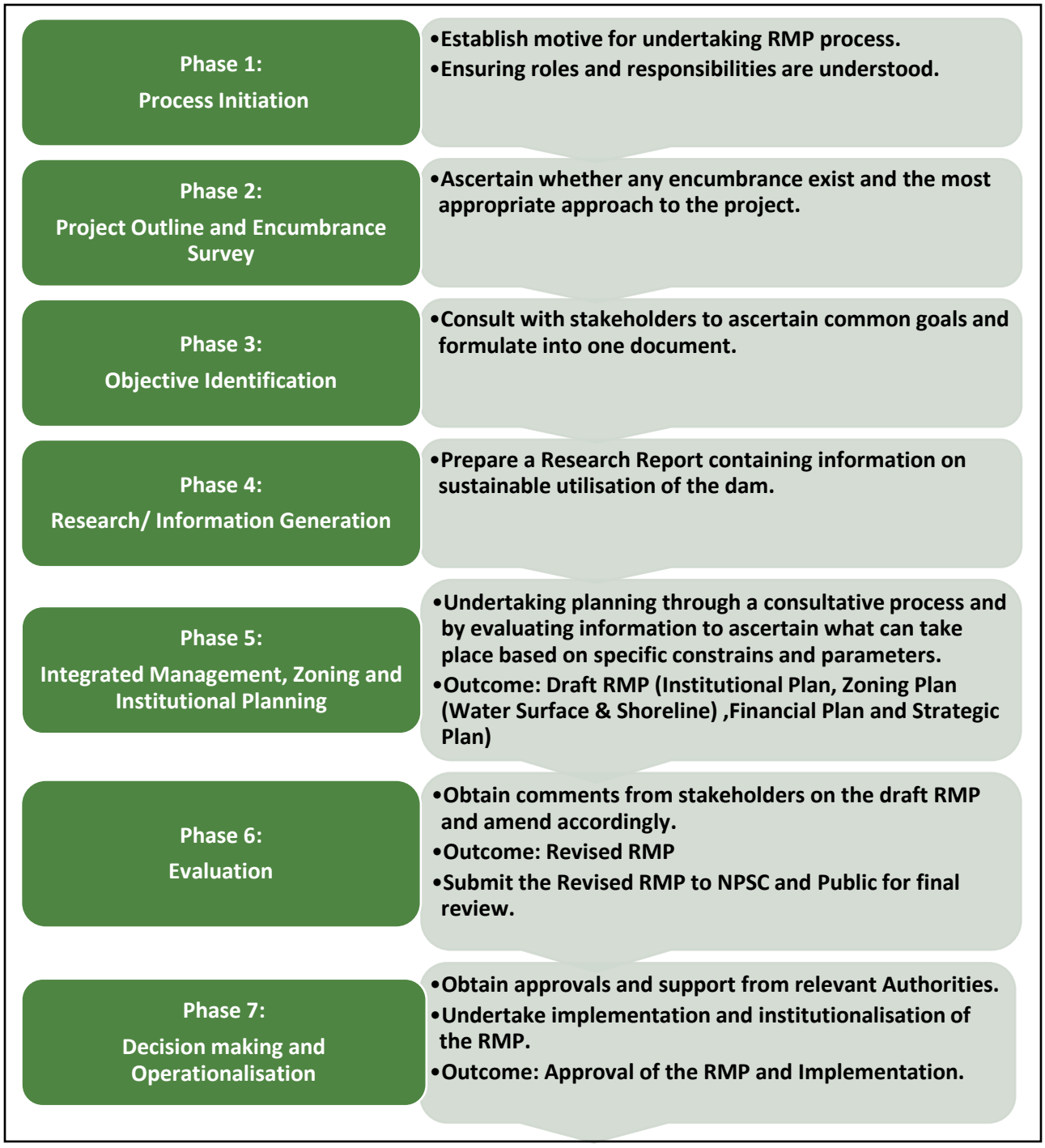

Figure 14: RMP Procedure

3.5 RMP PLANNING STAGES

3.5.1 Desktop Study

The desktop study was conducted with the aim of acquiring background information about the Setumo Dam. This was done through literature review. This study provided information such as the location of the dam, user groups, current activities, previous studies conducted for the dam.

3.5.2 Site Inspection

A site inspection was conducted at the dam on **03 November 2015** to gather baseline information using a checklist questionnaire. The site inspection was undertaken with the DWS delegates (DWS IEE, Northern Operations Manager, Dam Manager and Northern Operations Champion). Photos of the study area were also taken during site inspection.

3.5.3 Public Participation

Public Participation process (PP) is a process in which potential Interested and Affected Parties (I&APs) are given an opportunity to comment on or raise issues relevant to specific matters. The three (3) fundamental and theoretical objectives of PP process as stipulated in the DWAF's Guideline for Public Participation (2001) are:

- To improve decision-making;
- To bring about sustainable development; and
- To normalise the attitudes of Stakeholders (Authorities and I&APs).

A Public Participation was conducted in order to acquire information for **Phase 2 (Encumbrance Survey)**, **Phase 3 (Objective Identification)** and **Phase 4 (Research/ Information Gathering)** from stakeholders, which was used to complete **Phase 5 (Integrated Management, Zoning and Institutional Planning)**. In order to successfully complete the RMP, it is essential that the information obtained in the previous phases is utilised as planning input.

The public participation process for this project was formulated to include the following objectives:

- The identification of role players;
- The introduction of the RMP project to role players and inform them about their roles and responsibilities;
- The engaging of the Stakeholders (Authorities and I&APs) in the planning process;
- The answering of questions and noting of concerns;
- The identification of important issues, problems, conflicts and alternatives;
- Identification of the overall vision of the dam;
- The elimination of false expectations and preconceptions; and
- The creation of awareness amongst users.

DWAF's Guidelines for Public Participation (2001) outlines three (3) broad phases for public participation namely the **Planning**, **Participation** and **Exit** phase. Summarized below are the aspects of each phase and the approach for this project.

3.5.3.1 **Planning Phase**

The Planning Phase entails three (3) important aspects namely;

- Decision analysis;
- Participation planning; and
- Implementation planning.

During the **Planning Phase** a site inspection and literature review was conducted to gather baseline information about the dam. A process was also established to get into contact with the I&APs and relevant Authorities to ensure co-operative interests and support in the RMP project.

3.5.3.1.1 Role Players

It is recognized that different roles and responsibilities of the Stakeholders (Authorities and I&APs), and their relationship towards each other and the steps in the planning procedure

are imperative in the successful development of the RMP. It is also important that proper consultation with the public is done in order to produce a credible RMP. The success of this RMP is dependent on the level of involvement by the various Stakeholders. Numerous Stakeholders were identified and invited to participate in an open and consultative process. (See attached registered stakeholder list in **Appendix A**). The Stakeholder list is updated on a continual basis throughout the RMP process.

3.5.3.2 **Participation Phase**

The **Participation Phase** entails three (3) important aspects:

- Informing stakeholders – explained briefly under **3.5.3.4 Advertising Process.**
- Meeting the stakeholders – explained briefly under **3.5.3.5 Direct Communication.**
- Feedback – it is of utmost importance that feedback is directed to and from stakeholders. In this project feedback thus far has been given in a form of minutes of the meetings and follow up e-mails.

3.5.3.3. **Exit Phase**

The **Exit Phase** entails two (2) important aspects namely:

- Ensuring that all goals, challenges, concerns, objectives and the vision for the dam have been identified and documented in the RMP.
- Officially ending the public participation process for the RMP process.

During this phase, a draft RMP will be presented to the stakeholders so that they can comment and give inputs.

3.5.3.4 **The Advertising Process**

3.5.3.4.1 Distribution of the Background Information Document (BID)

The purpose of this document was to provide Stakeholders (Authorities and I&APs) with the background information about the proposed RMP project and to introduce the processes to be followed in developing the plan. It also aimed to inform authorities and I&APs on how to fully participate in the process and to encourage active attendance in Stakeholder engagement meetings. The BID was compiled from the information collated through the desktop study and site inspection (See attached **Appendix B**).

3.5.3.4.2 Newspaper Advert

A newspaper advert regarding the RMP project was placed on **Mahikeng Mail Newspaper.** The advert invited the public to attend the Public Participation Meeting. The advert was published in English on **21 June 2015.** Furthermore, an advert for the draft RMP was advertised on Mahikeng Mail Newspaper on **23 March 2016**. (See attached **Appendix C**).

3.5.3.4.3 Flyers Compilation and Distribution

Flyers were also used as a form of notification, they aimed at informing the I&APs about the public consultative meetings. The flyer detailed a brief description of the RMP, meeting date, time, venue and relevant contact details. The flyers were compiled in English and were distributed on **21 June 2016**

The flyers for the draft RMP were distributed on **23 March 2017**(See attached **Appendix D**).

3.5.3.5 **Direct Communication**

3.5.3.5.1 E-mails

Meeting invitations were sent out to authorities and I&APs notifying them about the scheduled consultative meetings. The invitation entailed the BID, meeting venue and time. The email notification was sent out on **13 July 2016** Moreover, the meeting invites for the draft RMP were sent out on **30 March 2017** (See Attached **Appendix E)**.

3.5.3.5.2 Authority Meeting

The initial authorities meeting was held on **13 July 2016** at Lotlamoreng Dam Hall.

The purpose of the meeting was:

- To present the RMP, its goal and the objectives of the project to the authorities; and
- To allow the authorities an opportunity to participate in the project by sharing information on their respective mandates.

The draft RMP was presented to the authorities on **05 April 2017.**

3.5.3.5.3 Public Meeting

The initial public meeting was held on **14 July 2016** at **Kgotla ga Kgosi Lekoma.**

The follow up meetings were held on **27 July 2016.** A platform was also given to I&APs to identify encumbrances / challenges that might hinder the progress of the RMP as well as to identify objectives and vision of the Setumo Dam.

Moreover, the draft RMP was scheduled to be presented to the public on **06 April 2017** and **09 May 2017** but due to poor attendance and weather issues the meeting never materialized.

3.5.3.6 **Comments and Reponses Register**

A copy of the draft report was circulated on **22** and **23 March 2017** for commenting (See attached **Appendix F**).

3.5.4 Planning Partners

RMPs are developed through a process of cooperative governance and Stakeholder participation. The distinctly different roles and responsibilities of the stakeholders, and their relationship towards each other and the steps in the planning procedure are imperative in the success compilation of the RMP.

The RMP provides for coordination between different governments and agencies to ensure that not only the objectives of DWS are attained, but also the objectives of other relevant Government Departments are attained. Such Departments includes among others as outlined in **Table 8.**

Table 8: Planning Partners and their Respective Mandates

Department/ Implementing Agency	Mandate
Mahikeng Local Municipality (MLM)	The dam is within the jurisdiction of the Municipality.
Barolo Boo Ratshidi	The dam is within the jurisdiction of Traditional Council.
Department of Agriculture, Forestry and Fisheries (DAFF)	The purpose of DAFF includes sustainable development and management of resources to maximizing the economic potential of the fisheries sector while protecting the integrity and quality of the country's aquatic ecosystems. Operation Phakisa expansion to inland dams is one of DAFF initiative aimed at unlocking economic potential of fisheries sector within the inland water. The latter programme will be used as benchmark for implementation of conservation policies while implementing job creation within fishery and fish processing market.
Department of Rural Development and Land Reform (DRDLR)	The department will assist in terms of Land Claims/Ownership issues.
Department of Environmental Affairs (DEA).	Responsible for Biodiversity Management within the dam including Invasive Alien Species.
Department of Public Works (DPW)	Has the power to regulate and control the use of state land outside the GWWs. In this regard, lease agreements or permits will be required from the department as some of the recreational activities will overlap into the state land.

Department/ Implementing Agency	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 also inland waterways.
National Treasury (NT)	The use of State assets is governed by National Treasury Regulations, requiring DWS to plan concessions in compliance or association with National Treasury, guided by the Tourism Public Private Partnership (PPP) Toolkit of 2005.
South African Maritime Safety Authority (SAMSA)	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.

3.6 RMP DATA ANALYSIS

3.6.1 Encumbrance Survey (Phase 2)

The purpose of the Encumbrance Survey is to investigate/ascertain whether any encumbrances exist around the dam and other factors that may influence the development and implementation of the RMP. The survey also identifies the information that is required for effective decision-making regarding the RMP (DWAF, 2006).

The identified encumbrances will assist DWS to identify hindrances and other factors that may influence the development and implementation of the RMP. The identified encumbrances are broken down into **Biophysical, Legal** and **Social.**

Tables 9-10 outline the summary of limitations that might affect the development or implementation of the RMP for the dam.

Table 9: Summary of Biophysical Encumbrances

Item	Description
Climate	• During winter periods frosts and mists might limit some of the recreational activities such as swimming and canoeing. This is due to health impacts associated with cold weather such as frostbites and also reduced visibility which can lead to fatal accidents.
Geology and Soil	• The dam is located on Aeolian Kalahari sand which can limit types of recreational structure to be developed in the area.
Vegetation	• Due to the dam's ecological status, all developments within or around the dam will require a proper planning and will be subject to various Legislations and feasibility study. • Invasive Species Management Programme needs to be compiled in order to manage Category 1b invasive plant species.
Fauna	• The dam and its surrounding environment is a home to near threatened, vulnerable as well as Alien Invasive Species. The occurrence of Alien Invasive Species may impact the Zoning Plan as the affected area will be classified as conservation zone. This may portray that the affected area has a high biodiversity value. • The presence of Alien Fish species in the water might lead to the habitat reduction, variety of diseases and genetic change to indigenous fish population. • Uncontrolled fishing practices can result in fish depletion if the issue is not addressed as a matter of urgency.
Water Quality	• Poor water quality limits the number of recreational activities such as swimming which can be introduced at the dam.

Item	Description
	• Poor water quality pose health risk to dam users as well as the biodiversity of the area and also reduces the recreational value of the dam.

Table 10: Summary of Legal Encumbrances

Item	Description
Purchased Boundary	• Unknown purchased boundary impacts negatively on the development of the RMP. As the Zoning Plan will be limited to the water surface.

Table 11: Summary of Social Encumbrances

Item	Description
Social Audit	• The majority of the local communities consists of Black Africans (99.42% of the population), which are generally afraid to utilise the water resource for recreational purposes. • Poor communities staying near the dam have no access and can easily be excluded in the recreational use of the dam including for food security (i.e. subsistence fishing). • Local community members interested in operating business venture at the dam can easily be excluded due to lack of capital.

Upon identifying the encumbrances, objectives needed to be identified in order to facilitate a planning procedure aimed at the compilation of a RMP. It is essential to clarify objectives to be met by the planning procedure (DWAF, 2006).

3.6.2 SWOT Analysis and Objective Identification

The SWOT Analysis was conducted to gather **Strengths** and **Opportunities** that define the potential of the dam whereas the challenges regarding the dam where identified through **Weaknesses** and **Threats**. The common key objectives were formulated and identified from the **Strengths** and **Opportunities** of the dam. Moreover, the vision for the dam for a period of 20 years was formulated by stakeholders from the identified objectives.

3.6.2.1 SWOT Analysis Approach

There were issues of concerns that were raised in the stakeholder engagement meetings prior to conducting the SWOT Analysis. Other challenges or encumbrances that may hinder the progress of the dam's RMP process were identified by the stakeholders following the SWOT analysis approach as illustrated in **Table 12.**

Table 12: SWOT Analysis for Setumo Dam

Strengths	Weaknesses
• Accessibility – located at gateway to Southern African Development Community (SADC) Region. • The dam can act as a major tourist attraction due to its accessibility and its popularity. • Absence of dangerous water fauna (i.e. Crocodiles and Hippos). • Availability of amenities around the dams (Electricity, roads, etc.). • The dam has a large surface area which can accommodate variety of recreational sports. • The shoreline of the dam is still relatively undeveloped.	• Poor safety measures around the dam. • Poor water quality. • Lack of information regarding the dam (such as dam boundary maps, previous studies done for dam). • Lack of Community Participation and Beneficiation programmes at the dam
Opportunities	**Threats**
• Community educational programmes and information sharing, so that the community can understand the importance of having a water resource and threats associated with thereof. • Job activities linked to various projects proposed around the dam. • Conduct feasibility study or research regarding the introduction of small based community fisheries at the dam. • The dam can accommodate large sporting events such as boating, fishing competition, etc. • Camping and caravanning can be one of the major activities around the dam if planned properly. • Providing environmental education to the local communities, more especially with regards to proper methods of fishing. • Establish security measures around the dam. • Improving the water quality of the dam.	• Washing (tents) along the Molopo River upstream of the dam affects the water quality • Pollution threats from sewage systems of the upstream of the dams (Setumo and Lotlamoreng). • Diverting of Molopo River upstream of the dams without proper authorisations, can contribute to the reduction of the dams' water level. • Lack of job opportunities. • Drowning incidents at the dam. • Poor water quality which contaminate the fish species thus posing danger to the humans consuming the fish from the dam as well as to the watering of the livestock. • Vandalism of facilities. • Lack of security and access control to the dam.

3.6.2.2 **Objective Identification (Phase 3)**

The set common key objectives were derived from the SWOT Analysis for the dam and have been categorized into three (3) Key Performance Areas (KPAs) as illustrated below:

KPA 1: Resource Management

- To determine the purchased boundary as well as associated lines (buffer line and 1:100 year flood line) for proper planning around the dam;
- To ensure that all activities undertaken within the dam are permitted by DWS and conducted in accordance with the relevant legislation and policies;
- To remove the alien invasive species at the dam;
- To improve and maintain acceptable water quality standard in the dam; and
- To compile a Zoning Plan for the dam which will integrate conservation, recreation and development whilst not retarding the primary functions of the dam.

KPA 2: Resource Utilisation

- To ensure safety regarding the recreational use of the dam;
- To meet the user needs and satisfy government requirements regarding the standard of activities and facilities, appropriateness of land use, compliance with applicable legislation and rights of use as well as access to the dam;
- To provide adequate public access for public use of the water resource and its associated State Land through controlled authorized access and associated infrastructure development;
- To promote, accommodate and manage a variety of activities and facilities within the dam basin in a manner that enhances the user's experience and minimizes the impact on the resource; and
- To promote a sustainable harvesting of fish.

KPA 3: Benefit Flow Management

- To ensure that local communities participate and benefit in local development initiatives happening in and around the dam. This can be through development of eco-tourism, recreational opportunities as well as subsistence fishing; and
- To establish capacity building and training within the local communities.
  To ensure that a suitable and efficient institutional structure with appropriate powers and delegations is in place to effectively manage the recreational utilization of dam and its associated State Land in accordance with the RMP to be developed for the dam.

Action projects required to achieve these objectives are provided in detail in **Section 4.3** (**The Strategic Plan**).

The vision for the dam in a period of 20 years was formulated from the key common objectives identified by the stakeholders and stands as follows:

"A commitment to protect, manage, control and utilize the resource in a sustainable, equitable and effective manner in order to maximise the recreation potential of the dam and also to ensure that the use of the dam is beneficial to the local communities".

After setting both the dam's specific objectives, a research was conducted in order to provide relevant information to decision – makers regarding the sustainable utilisation of the water resource and where applicable the Sate Land..

3.6.3 Research/ Information Generation (Phase 4)

The aim of undertaking the research process was to collect the relevant data about the dam. This will serve as a decision-making guideline tool, guided by the objectives set for the dam and any limitations due to encumbrances. The report

documents the following data as illustrated in **Figure 15**.

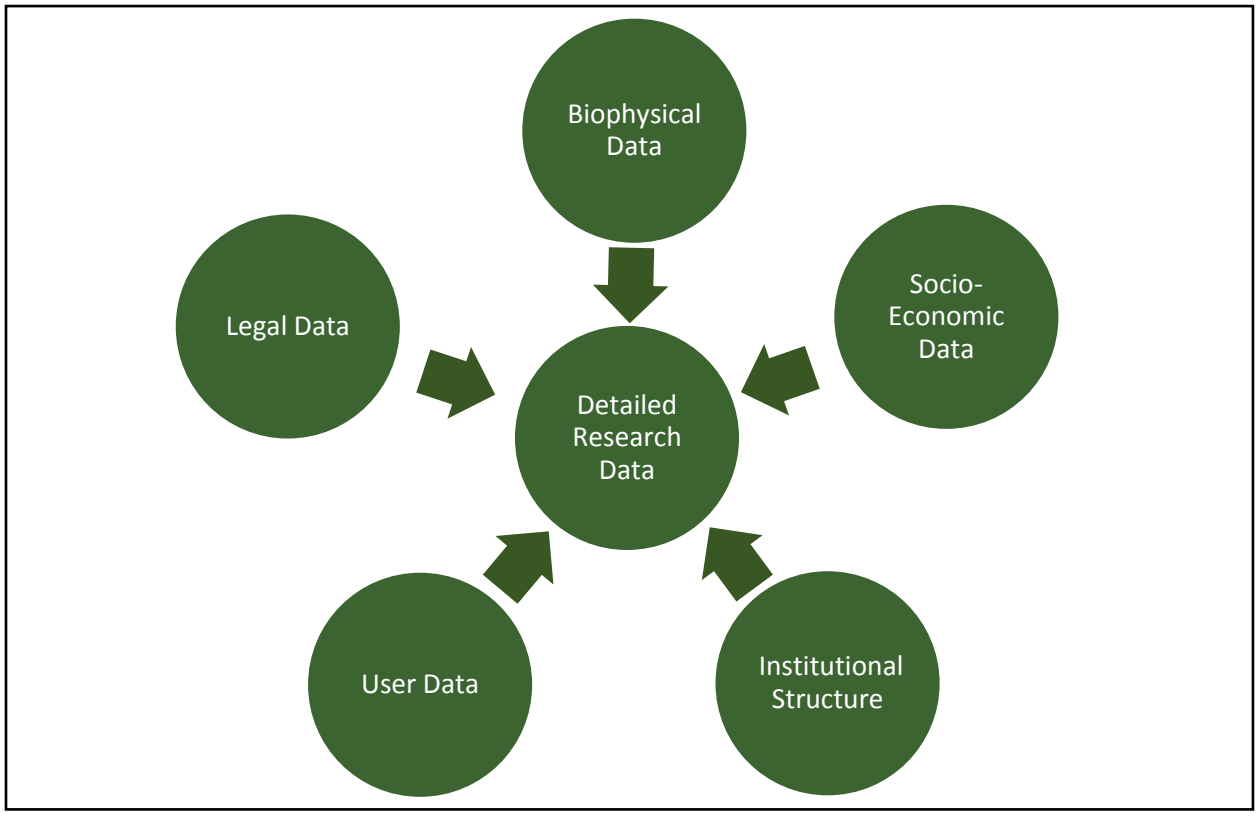

Figure 15: Research Data

The main aim of the research was to identify the dam tourism development potential and also to evaluate the practicability/ feasibility of the potential objectives identified.

3.6.3.1 **Tourism Development Potential**

The dam is a significant tourism node which offers some water based recreational activities such as angling. The dam has also attracted a number of lodges, resorts, angling and camping clubs.

3.6.3.2 **Feasibility of Potential Objectives**

According to DWAF (2006), the feasibility of the proposed objectives needs to be determined in light of the local environmental conditions. **Table 13** shows the practicability of all proposed recreational objectives.

Table 13: Feasibility of Potential Recreational Objectives

KPA 1:Resource Management		
Objective	**Status Quo**	**Practicability**
• To determine the purchased boundary as well as associated lines (buffer line and 1:100 year floodline) which assists with proper planning around the dam**.**	• The dam was built by former Bophuthatswana Government as such there is no much information with regards to the extent of the GWWs. Furthermore, DWS (Land Matters Section) indicated that the dam is not yet properly surveyed.	• DWS is planning to conduct a survey to determine DWS's purchase boundary (buffer lines, floodline and high floodline).
• To ensure that all activities undertaken within the dam are permitted by DWS and conducted in accordance with the relevant legislation and policies such as NWA, NEMA Regulations and Mining permits applied at DMR.	• There are many infrastructures which have been erected within the dam without the knowledge of DWS. • There is Illegal sanding mining taking place at the dam. The surrounding community needs education awareness on how to mine legally and what procedures to follow when applying for mining authorisation/permits.	• Involvement of recreational industries to promote safety regarding the use of the dam for leisure sports (e.g SAMSA to promote safety regarding the use of Inland vessels etc). • As part of the RMP process an institutional structure should be implemented to effectively manage the dam for recreational use.
• To remove the alien invasive species at the dam.	• Alien invasive species have a detrimental effect on the natural ecology of the dam and its surrounding. These species result in a decrease in indigenous biodiversity and the overall degradation of the ecological integrity of the dam. The dam and its surrounding is a home to alien fish species (such as trout) and also the alien invasive species such as *Argemone Mexican and Nicotiana glauca. (*These terrestrial Alien Plant Species are categorized in Category **1b)**.	• Remove all invasive alien vegetation (*Argemone Mexican and Nicotiana glauca*) within the dam and the surrounding area. • Engage the DEA (Working for Water Programme) further to aid in the management of the Alien Species at the dam. • Establishment of educational programmes regarding the negative impacts of Alien Invasive Plants on the dam. • Dam survey is needed to identify more Alien Invasive Plants Species. The information will help in the development of a species management plan to control and eradicate them.
• To improve and maintain acceptable water quality in the dam.	• The water quality is a key issue that needs to be addressed to ensure that the water is fit for recreational use. • The dam is situated near urban areas and is subjected to various sources of pollution within the catchment. Currently the dam is classified as hypertrophic and exhibits regular eutrophication	• A management plan should be developed to address the management of waste within the dam and upstream. The use of fertilizers, herbicides and pesticides should be discouraged. • The current water quality issues should be investigated to identify source and point of pollution.

	problems. Poor water quality affects both the biodiversity and the recreational use of the dam.	• Water quality monitoring to be linked with DWS Incident Management System to allow quick response. • DWS in conjunction with the NMMDM and MLM should consider establishing a proper sewage system to service the areas around the dam.
• To develop a Zoning Plan for the dam.	• Currently there is no Existing Zoning Plan for the dam. As part of the RMP process, Zoning Plan should be developed or updated in order to avoid recreation user conflict.	• According to the RMP guideline, a Zoning Plan must be compiled in terms of DWAF's Guidelines for Compilation of Zoning Plans for Government Waterworks (DWAF, 1999). • The Zoning Plan should accommodate all feasible recreational activities within the dam.
KPA 2:Resource Management		
Objective	**Status Quo**	**Practicability**
• To ensure safety regarding the recreational use of the dam. • To meet the user needs and satisfy government requirements regarding the standard of activities and facilities, appropriateness of land use, compliance with applicable legislation and rights of use as well as access to the dam.	• The dam is a major attraction to various water based sports and outdoor enthusiasts within the Province. Currently there is no overarching safety system at the dam and no mechanism for reporting of environmental and recreational emergencies and incidents.	• Implementation of DWS Incident Management System. • Develop information material (i.e. signage and pamphlets etc.) to convey safety rules at the dam. • Appoint safety officers to ensure that the safety rules are adhered to at all times. • Develop specific rules for activities or uses for which this may be required. • Implementation of standardised and harmonised AtoN and Demarcation Markers. • Implement all other aspects of the CIWSP best practice model. • Establish density controls for activities and facilities that requires carrying capacity assessments (i.e. number of vessels per hectare). • Spillway to be fenced off to prevent unauthorized access and ensuring community safety.
• To provide adequate public access for public use of the water resource and its associated State Land through controlled authorized access and associated infrastructure development.	• The dam is a very popular destination within the basket of provincial leisure products, however, it has no authorized public access and as such, the provision of public access is of outmost importance to the surrounding Local Communities. Furthermore, the existing infrastructures are in a state of despair and requires upgrade.	• An agreement needs to be entered into by DWS and the entity which will manage and operate public facilities. • Public access should be provided and the entry fees need to be reasonable to ensure that the dam remains accessible and affordable to the local community.

• To promote, accommodate and manage a variety of activities and facilities within the dam basin in a manner that enhances the user's experience and minimizes the impact on the resource.	• Carrying capacity is an effective management tool to control access, utilization and development within the dam basin. Overuse of the dam may not only impact on the water resource and the surrounding environment, but will also affect the safety and users experience. This can also results in social impacts such as, crimes, accidents, conflicts, etc.	• Implement density controls as per approved accepted utilization level. • Types of recreational activities which will not be permitted within the dam basin should also be clearly stipulated.
• To promote sustainable harvesting of fish	• Subsistence fishing by the Local Community remains an active use of the dam, however, this must be regulated by relevant policy to avoid overfishing within the dam. These can also be used to manage alien invasive fish species such as carp and bass fish abundant within the dam.	• Management authority or DWS must develop a communication signage in order to effectively inform different angling groups about the dam fishing rules. • Appoint safety officers that will monitor compliance of the dam fishing rules.
KPA 3:Benefit Flow Management		
Objective	**Status Quo**	**Practicability**
• To ensure that local communities participate and benefit in local development initiatives happening in and around the dam. This can be through development of eco-tourism, recreational opportunities as well as subsistence fishing.	• The provincial and local governments identify tourism sector as a vehicle for development within the province. The accessibility of the dam and its historical significance makes the dam ideal destination for various recreational use. Potential exists for various sports and leisure activities including swimming, fishing picnicking and camping. It is imperative that the local communities benefit from tourism projects implemented at the dam.	• Formalize an agreement with local community fishers regarding access and use of the dam for subsistence fishing. • Develop a strategy on capacity building and training programmes at the dam and implement accordingly. • DMC to develop and undertake awareness campaign focusing on the potential uses of the dam, importance of protecting infrastructures around the dam, dam safety and as well as possible danger associated with using the dam for recreational purposes. • The potential for small scale fisheries projects for the local community to be considered. This should include training,

• To establish capacity building and training within the local communities.		provision of vessels and other required apparatus to be used. • DWS in collaboration with the IA should compile a database of job seeking individual and small companies from local community. This database should be used for every project to be undertaken within the dam or linked to the dam itself. • Develop a strategy on capacity building and training programmes at the dam and implement accordingly. • The potential for nature sensitive overnight facilities to be considered. • Dedicated areas should be made available for investors in order to attract the investment into the area. This exercise should be undertaken within the Public Private Partnership (PPP) principles. • Discussion between the local schools and universities regarding possible use of the dam for educational purposes. • Lifeguard skill training and first aid training to be provided to improve safety in regards to utilization of the dam.
• To ensure that a suitable and efficient institutional structure with appropriate powers and delegations is in place to effectively manage the recreational utilization of dam and its associated State Land in accordance with the RMP to be developed for the dam.	• Officially, the dam is managed by DWS, who functions as the custodian of all surface water in the Republic of South Africa. Currently, there is no institutional structure in place to manage recreational use of the dam.	• The main component of the RMP is to implement an institutional structure with the understanding that many government departments/ agencies have direct or indirect mandate in managing the dams. • Formalization of an institutional structure, which is representative of all relevant Stakeholders. • The roles and responsibilities of the role players must be clearly defined and understood. • The improvement of incident management through the implementation of the CIWSP best practice model. • Improved institutional arrangements and management, through the implementation of standardised and harmonised AtoN and demarcation markers in order to improve safety of navigation by implement AtoN and demarcation markers as required.

CHAPTER 4: INTEGRATED MANAGEMENT, ZONING AND INSTITUTIONAL PLANNING (PHASE 5)

The purpose of this phase is to evaluate the information obtained from previous stages to ascertain what could be achieved based on specific constraints and parameters of the various input factors such as biophysical, cultural and socio-economic, current institutional and the needs of the dam users. The Integrated Resource Management Plan (IRMP) will take into account the following:

- Biophysical, cultural and socio-economic and user needs constraints;
- Development potential and requirements;
- Site planning and Zonation;
- Programmes and plans that will unlock the potential of the water resource; and
- Institution options and legal aspects required to create these programmes and plans.

The IRMP is broken down into four (4) main plans namely the **Institutional Plan**, **Zoning Plan, Strategic Plan** and **Financial Plan** as illustrated in **Figure 16.**

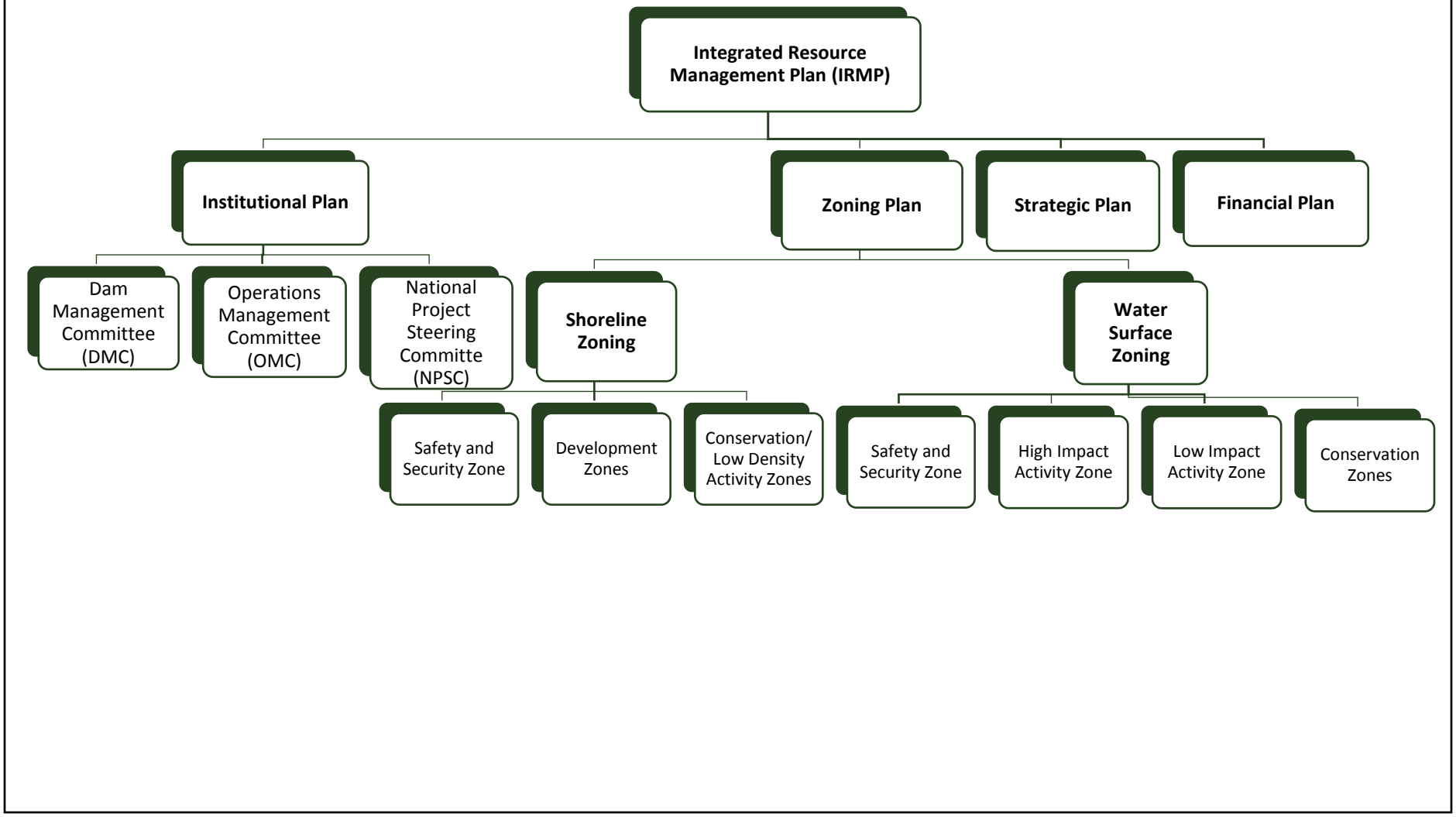

Figure 16: Integrated Resource Management Plan

4.1 INSTITUTIONAL PLAN

The Institutional Plan provides a framework for the institutional arrangements at the dam. The proposed management systems includes three (3) committees namely; a Dam Management Committee (DMC), Operations Management Committee (OMC) and a National Project Steering Committee (NPSC). The appointed management authorities by DWS at the dams, will also form part of the institutional structure.

4.1.1 Dam Management Committee (DMC)

DMC refers to any party that is interested or affected by the dam and will assist in raising and addressing issues relating to the dam.

One of the main functions of the DMC is to give support to Implementing Agency (IA) in the management of the dam for recreational purposes. Moreover, to assess commercial opportunities at the dam. As such, an agenda item related to the Strategic Plan for commercialization 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 must meet quarterly.

The functions of the DMC include the following (amongst others):

- Seeking resolution for general management issues;
- Monitoring the practical implementation of the RMP and BP;
- Reviewing the feedback received from I&APs;
- Operational management of recreational activities such as ensuring the floating AtoN and demarcation markers are in place and setting times for use of the dam (no recreational activities can take place between sunset and sunrise);
- Implementation of Management Objectives and decisions pertaining to the dam to the relevant stakeholders; and
- Management of the incident management system and wash bays.

Figure 17 illustrates the proposed user groups that will form part of the DMC.

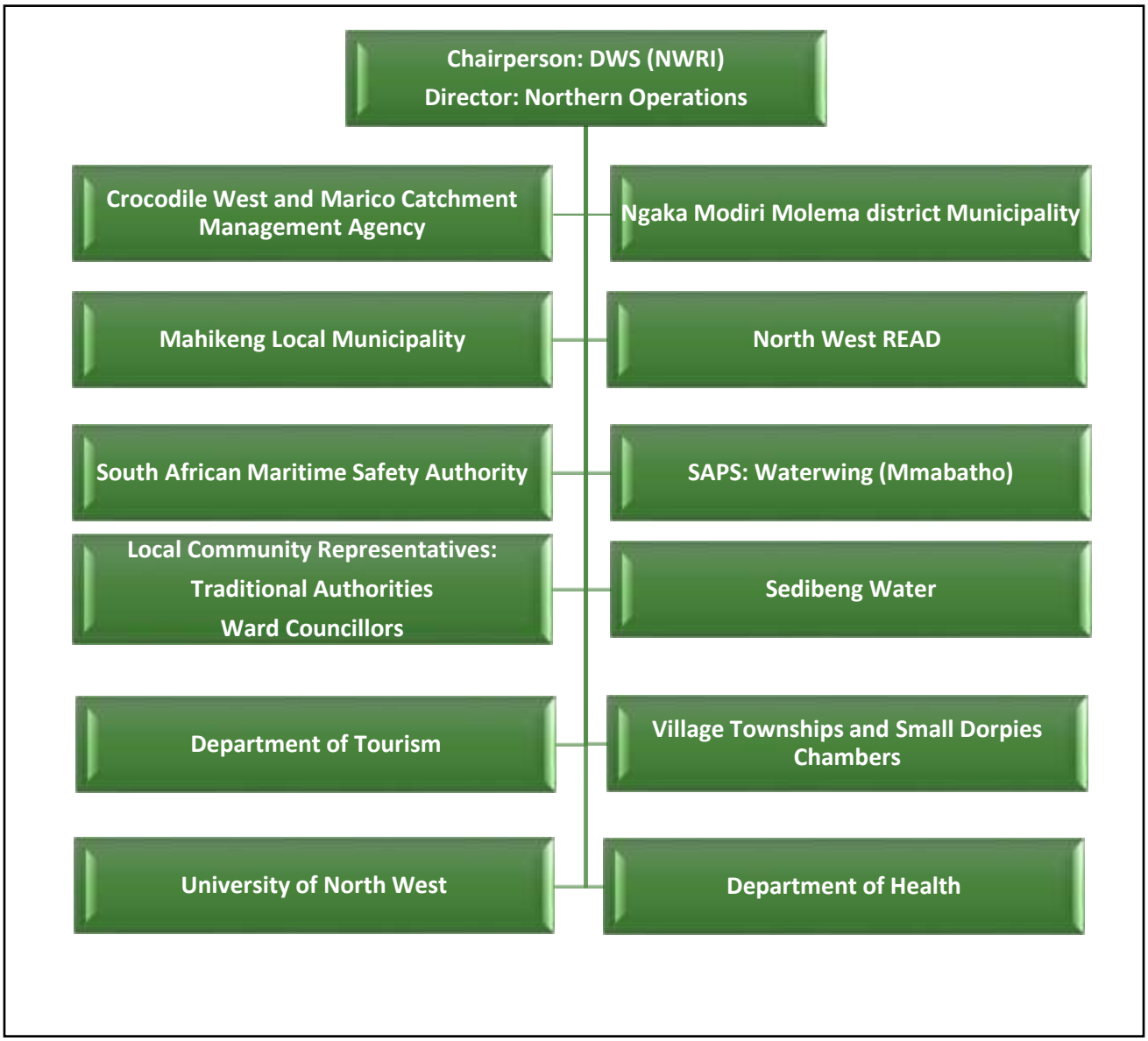

Figure 17: Proposed DMC

The DMC will have a number of management tools which will enable proper management of the dam in line with existing Legislations and Regulations requirements.

4.1.1.1 **Management Tools**

Terms of Reference

The DMC and NPSC will be guided by Terms of Reference (ToR) regarding roles and responsibilities. ToR is not required for the **OMC** as this is an existing reporting structure. The ToR provides guidance on the following management aspects:

- 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.
- Management of water quality monitoring;

- Management of the control of aquatic invasive species;
- Management of development pressure.
- Management of incident management system; and
- Management of AtoN and demarcation markers.

Agreements

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

Access Agreements

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

The wash bay (if applicable) must be built on State Property as part of the CIWSP. A formal agreement is necessary on the management and maintenance of the facility.

Safety of Navigation Agreements

In addition to its common law responsibility, DWS is, in terms of the requirements described in the National Water Act, 1998 (Act No. 36 of 1998), amongst others, responsible for the safety of GWWs 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 AtoN[4] for general navigation.

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

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

Event Applications

All events must be managed through an event application process. The applications will be submitted to the IA for approval and to DWS for commenting. 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); and
- Access points to be used.

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

National Affiliations

All recreational clubs should be affiliated to a SASCOC affiliated organisation. The development targets set by the National Organisations must be met.

4.1.2 Operations Management Committee (OMC)

There is an existing Chief Director: Infrastructure Operations Management Committee (CD: IO MANCO) within Infrastructure Operations which comprises of all directors of four (4) operations (Northern, Southern, Eastern and Central) and is chaired by the Chief Director: Infrastructure Operations within NWRI as illustrated by **Figure 18.**

The committee discusses matters relating to operations and maintenance of all GWWs. A RMP must be a standard agenda item. Any matters relating to the RMP that are outside the scope of DWS will be escalated to the NPSC.

[4] AtoN refers to any sort of marker which aids the traveler in navigation; the term is most commonly used to refer to nautical or aviation travel, common types of such aids include lighthouses, buoys, fog signals and day beacons.

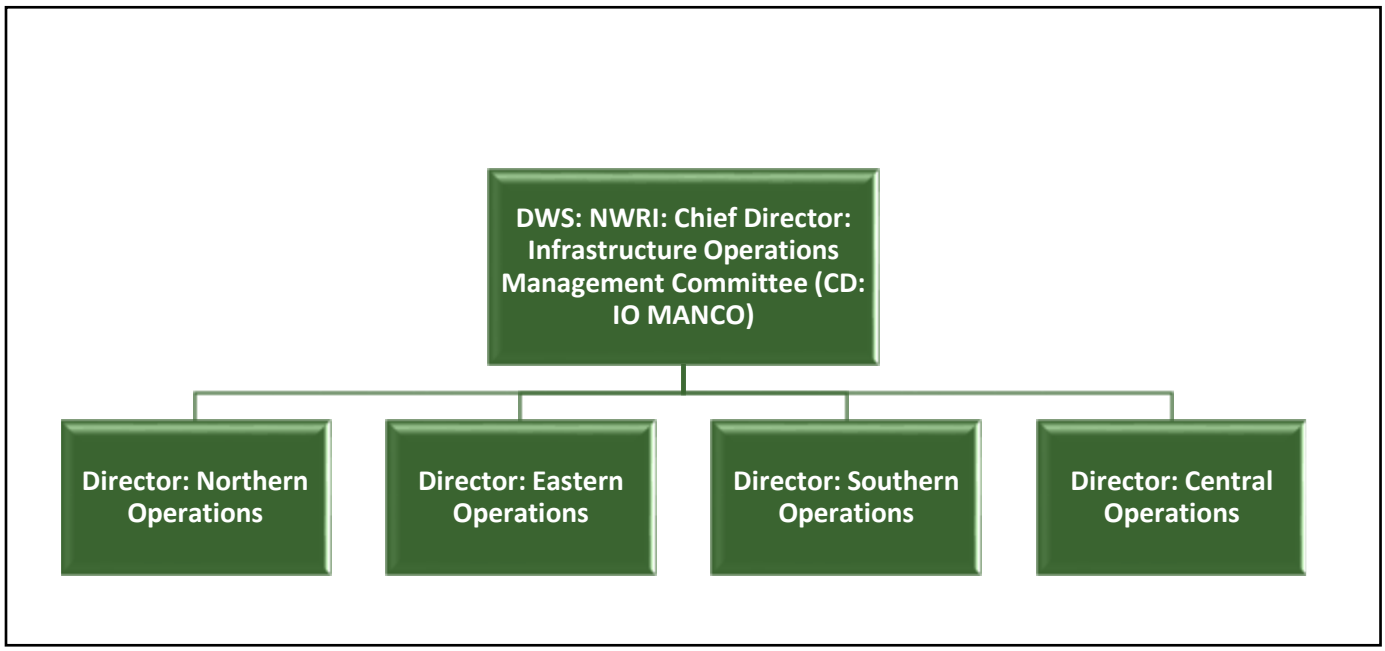

Figure 18: Existing CD: IO MANCO

4.1.3 National Project Steering Committee (NPSC)

NPSC is formed by DWS and is made up of representatives from National Government Departments and Implementing Agencies that are relevant in terms of managing the water resource.

The primary function of the NPSC is to provide guidance on recreational water use in terms of their respective mandates as well as to ensure that continuous support by different Government Sectors is provided to the dam with the aim of achieving sustainable utilisation of the dam for recreational purposes. The NPSC should meet twice a year. **Figure 19** illustrates a typical Governmental Departments that will form part of the NPSC:

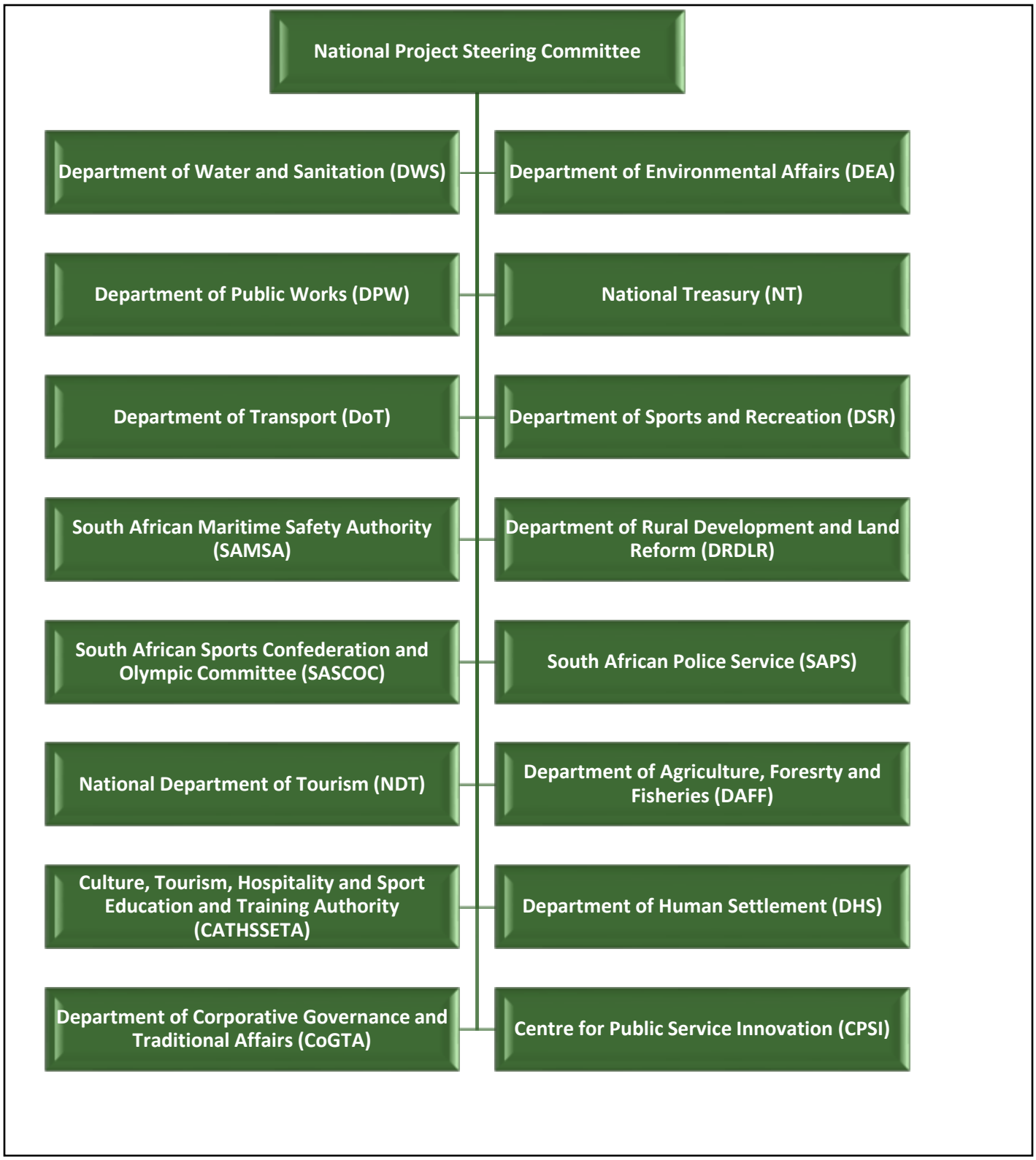

Figure 19: Proposed NPSC

The role of the relevant departments forming part of the NPSC is listed below:

Centre for Public Service Innovation (CPSI):
The CPSI is supporting a multi-departmental working group that is developing an innovative approach to inland water and safety integrity. The project, was initiated out of the need to find an innovative, practical and cost-effective way to implement SAMSA' vessel safety regulations on inland waterways and to implement responsible water use within the broader socio-economic context of the country.

The CIWSP is a project piloted by CPSI that is a partnership between multiple Government entities and between the Government and communities. The main aim of the project is to enhance the development of a best practice model to ensure safe and structured inland maritime environment and culture, whilst protecting the country's precious water resource.

Culture, Arts, Tourism, Hospitality, Sport Sector, Education and Training Authority (CATHSSETA):
CATHSSETA deals with the approval and financing of training relating to culture, hospitality, tourism and sport sectors.

Department of Agriculture, Forestry and Fisheries (DAFF):
The purpose of DAFF includes sustainable development and management of resources to maximizing the economic potential of the fisheries sector while protecting the integrity and quality of the country's aquatic ecosystems.

Operation Phakisa expansion to inland dams is one of DAFF initiative aimed at unlocking economic potential of fisheries sector within the inland water. The latter programme will be used as benchmark for implementation of conservation policies while implementing job creation within fishery and fish processing market.

Department of Corporative Governance and Traditional Affairs (CoGTA):
Its function is to develop national policies and legislation with regard to Provinces and Local government, and to monitor their implementation. Other function of the Department is to support Provinces and Local Government in fulfilling their constitutional and legal obligations.

Department of Environmental Affairs (DEA):
DEA is mandated to give effect to the right of citizens to an environment that is not harmful to their health or wellbeing, and to have the environment protected for the benefit of present and future generations. In relation to the RMP, the Department should ensure that Environmental Impact Assessments is undertaken for all activities that triggers EIA Regulations at the dam. Furthermore, DEA through WfW programme can assist to eradicate alien invasive plants species (Blue Gums and Parrot Furthers) and alien invasive fish species at the dam.

Department of Public Works (DPW):
DPW has the power to regulate and control the use of state land outside the GWWs. In this regard, lease agreements or permits will be required from the Department as some of the recreational activities will overlap into the State Land, e.g. trail running, biking and running.

Department of Rural Development and Land Reform (DRDLR):
The Department is tasked with the facilitation of land claims within the country. They are also involved in rural development by improving both economic infrastructure (such as roads, etc.) and social infrastructure (e.g. communal sanitation and non-farming activities).

Department of Sports and Recreation (DSR):
The Department is mandated to promote and develop sport and recreation activities and also in co-ordination of the relationships between the Sports Commission, national and recreation federations and other agencies.

Department of Tourism (NDT):
The Department is mandated to create conditions for the sustainable growth and development of tourism in South Africa. The Tourism Act makes provision for the promotion of tourism to and in the Republic and for regulation and rationalisation of the tourism sector, including measures aimed at the enhancement and maintenance of the standards of facilities and services utilised by tourists; and the co-ordination and rationalisation of the activities of those who are active in the tourism sector.

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 small vessels and inland waterways.

Department of Water and Sanitation (DWS):
DWS through the National Water Act, 1998 (Act No. 36 of 1998) is mandated to protect aquatic and associated ecosystems and their biological diversity as well as to reduce degradation of the water resources. As part of its mandate, DWS initiated the development of RMPs together with the supporting BPs with the aim of ensuring sustainable and equitable development, utilisation and management of GWWs.

National Treasury (NT):
The Department is mandated to support the optimal allocation and utilisation of financial resources in all spheres of government. As part of the RMP, The National Treasury Public Private Partnership (PPP) Toolkit for Tourism (2005), will assist the process of tourism-based businesses development on State-owned Land. The Toolkit make it easier for Institutions and the Private Sector to enter into tourism related partnerships on State Property managed by National, Provincial and Local Government Institutions.

South African Maritime Safety Authority (SAMSA):
Administers and executes maritime related legislation and regulations, including the National Small Vessel Safety Regulations and ensures standardisation, harmonisation and compliance of all AtoN in South African waters.

South African Police Service (SAPS):
The South African Police Service have been entrusted with the responsibility of creating a safe and secure environment for all people in South Africa as well as to prevent anything that may threaten the safety or security of any community.

South African Sports Confederation and Olympic Committee (SASCOC):
SASCOC is mandated to promote and develop high performance of sports as well as to act as a controlling body for sports in South Africa. It can also assist to coordinate organise events at the dam.

4.2 ZONING PLAN

According to DWAF RMP Guideline DWAF (2006), a site-specific master planning and zoning which describes a framework for the allocation of zones needs to be undertaken based on the results of the Encumbrance Survey and basic Research regarding the Bio-physical, Social and Cultural environment as well as the objectives set by the Stakeholders (refer to section **3.6)**.

The proposed Zoning Plan will integrate conservation, recreation and development whilst not retarding the primary functions of the dam.

4.2.1 Water Surface Zoning

The water surface zoning provides guidance on permissible and non-permissible recreational activities on the water surface taking into account the biophysical factors of the dam. The Water Surface is zoned as follows:

Safety and Security Zone:

It covers a minimum of 100m area from the wall and outlet works indicated by demarcation markers and AtoN. This area is reserved for DWS management purposes.

Management of this zone is aimed at protecting the dam wall and outlet works, as well as to ensure the safety of the public. This is a no-go zone to the public unless authorised.

Conservation Zones:

The aim of this zone is to conserve and protect sensitive aquatic habitation at the inlet(s) of the dam. According to Section 12 and 26 of NWA, the existence of these zones is thus not negotiable as it is imperative to protect the water resource for the purposes relating to basic human needs, environmental sustainability and water quality requirements. Access to these areas is generally not allowed due to the following:

- The areas intercept sediments and nutrients/pollutants which pose safety risks to the public due to muddy clay, and
- They are used by aquatic birds and fish species as habitat, refuge and breeding areas.

Low Impact Activity Zone:

This zone act as a buffer between High Impact Activity Zones and Conservation Zones. Low Impact Activity Zone allows for low intensity activities, i.e. activities associated with little or no wake such as wind surfing, kayaking, swimming, rowing, sailing, paddle boating, float tubes, canoeing, angling, yachting, aquaculture and small scale fisheries.

High Impact Activity Zone:

This zone has the largest water surface area and is located where the reservoir is at its deepest. It caters for high impact activities associated with high speed, wake and noise activities such as motorised boating, house boating, water skiing, and para-sailing.

The water surface zoning colour coding means the following:

Colour	Zone Description
Red	Safety and Security Zone
Green	Conservation Zone
Sky Blue	Low Impact Activity Zone
Dark Blue	High Impact Activity Zone

Table 14: Proposed Water Surface Zoning Descriptions

Zone Name	Permissible Activities	Non Permissible Activities	Recommendation
• Safety and Security Zone.	• Alien invasive species clearing • Management of dam infrastructure • Management and maintenance activities by DWS and authorised personnel	• Public access	• Area should be demarcated by dermacation makers and AtoN.
• Conservation Zones.	• None	• Public activities (to prevent disturbance of aquatic habitats).	• Area should be demarcated by demarcation makers and AtoN. • Strict management and control of these areas, especially with regards to illegal fishing, sand mining and dumping.
• Low Impact Activity Zone.	• Activities associated with no or little wakes, such as: ○ Angling ○ Swimming ○ float tubes ○ Canoeing ○ Rowing	• Motorised boating • Water Skiing • Kite-surfing • Jet skis	• Area should be demarcated by demarcation makers and AtoN.

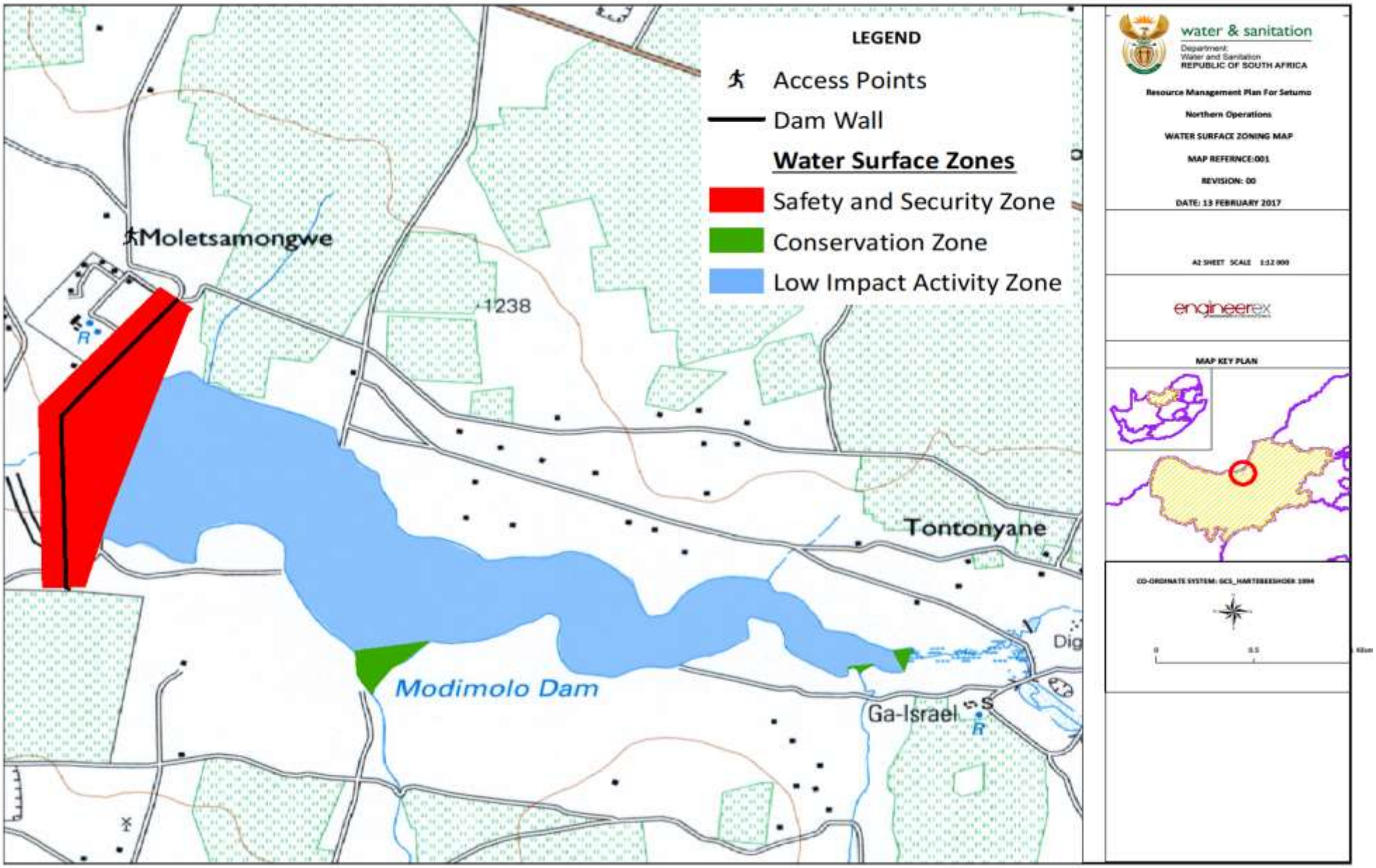

Figure 20: The proposed Water Surface Zoning Map

4.2.2 Shoreline Zones[5]

In addition to the water surface zoning, an integral part of the RMP is also shoreline zoning, which provides guidance on what recreational activities (if any) are permissible and not permissible on the land adjacent to the dam (DWS purchased boundary). The management zones include:

Safety and Security Zone (dam wall and associated DWS infrastructure):

It is applicable to the area surrounding the dam wall and the outlet works. The extent of this zone is determined by DWS and shall not be less than 100m from the dam wall and downstream. This area is reserved for DWS management purposes.

Management of this zone is aimed at protecting the dam wall and outlet works, as well as to ensure the safety of the public and surrounding areas. This is a no-go zone to the public unless authorised.

Conservation / Low Density Activity Zone:

This zone consists of ecologically sensitive areas and areas with high biodiversity. It also includes the area around the inlets of the dam. Access to this area is limited to low impact activities such as hiking, bird watching, etc. This area is reserved to prevent ecological damage due to development activities hence high impact development not permitted.

Medium Density Activity Zone:

This area is reserved for small scale activities such as day visitors, picnic areas, shoreline fishing, camping (tent and caravan), braai facilities, swimming pools, ablution facilities and infrastructure for services.

High Density Activity Zone:

This area is reserved for large scale activities including chalets, recreational club houses, infrastructure for services, and Land Based Aquaculture.

Community Resource Zone:

This zone is for the sole beneficiation of the local communities in ensuring that their livelihood is maintained and improved. Activities include subsistence fishing, livestock watering points, small scale community gardens, etc.

The shoreline zoning colour coding means the following:

Colour	Zone Description
Red	Safety and Security Zone
Green	Conservation/ Low Density Activity Zone
Yellow	Medium Density Activity zone
Orange	High Density Activity Zone
Brown	Community Resource Zone

[5] Permanent structures within the purchase line are not allowed. All developments should be outside the 1:100 year floodline.

Table 15: Proposed Shoreline Zoning Description

Zone Name	Permissible Activities	Non-permissible Activities	Recommendation
• Safety and Security Zone.	• Fire management • Alien invasive species clearing • Management of dam infrastructure • Management and maintenance activities by DWS and authorised personnel	• Public access	• A minimum area of 100 m wide downstream the dam wall should be demarcated preventing public access and use.
• Conservation/ Low Density Activity Zone.	• Conservation management activities: ○ Bird watching	• Development	• These zone should control access to ecological sensitive areas.

• Medium Density Activity Zone.	• Camping (tent and/or caravan)
	• Day visitors
	• Picnic
	• Shoreline fishing
	• Braai facilities
	• Swimming pools
	• Ablution facilities
		• Accommodation facilities such:
		  ○ Chalets
		  ○ Recreational club houses
			• The management of this area should follow the PPP process in terms of National Treasury.
			• All developments must be approved by DWS.
			• Requirements of NWA and NEMA must be taken into account in all developments.
			• All developments should adhere to the approved SDM Tourism Master Plan to ensure development does not impact negatively on dam and must blend in with the natural environment.
			• Noise levels to be kept at a minimum.
			• Camping, picnicking, bank angling and access to the water must be done in accordance to access agreements.
			• Camping and picnicking is allowed only in designated areas.
			• Noise levels to be kept at a minimum.
			• No littering at Camping and Picnic spots.

• Community Resource Zone.	• Subsistence fishing • Livestock water drinking points	• Chalets • Recreational club houses • Hiking • Braai facilities • Camping • Swimming pools	• Demarcation of the area by fence and provision of an access control. • The Community Resource Zone is approximately 2 km from the access point and is adjacent to the existing community. This zone is for livestock water drinking point and subsistence fishing.

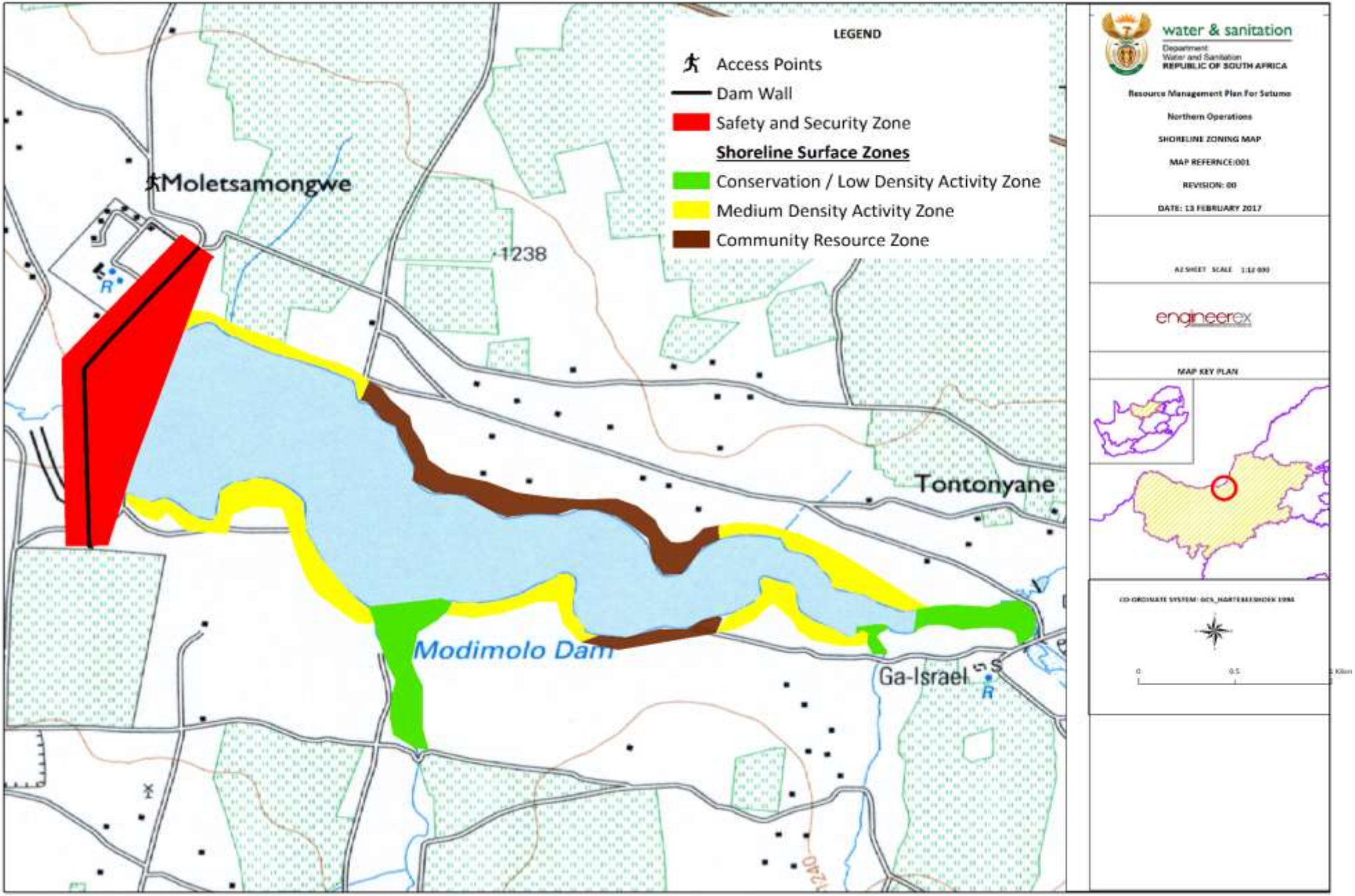

Figure 21: Proposed Shoreline Zoning Map

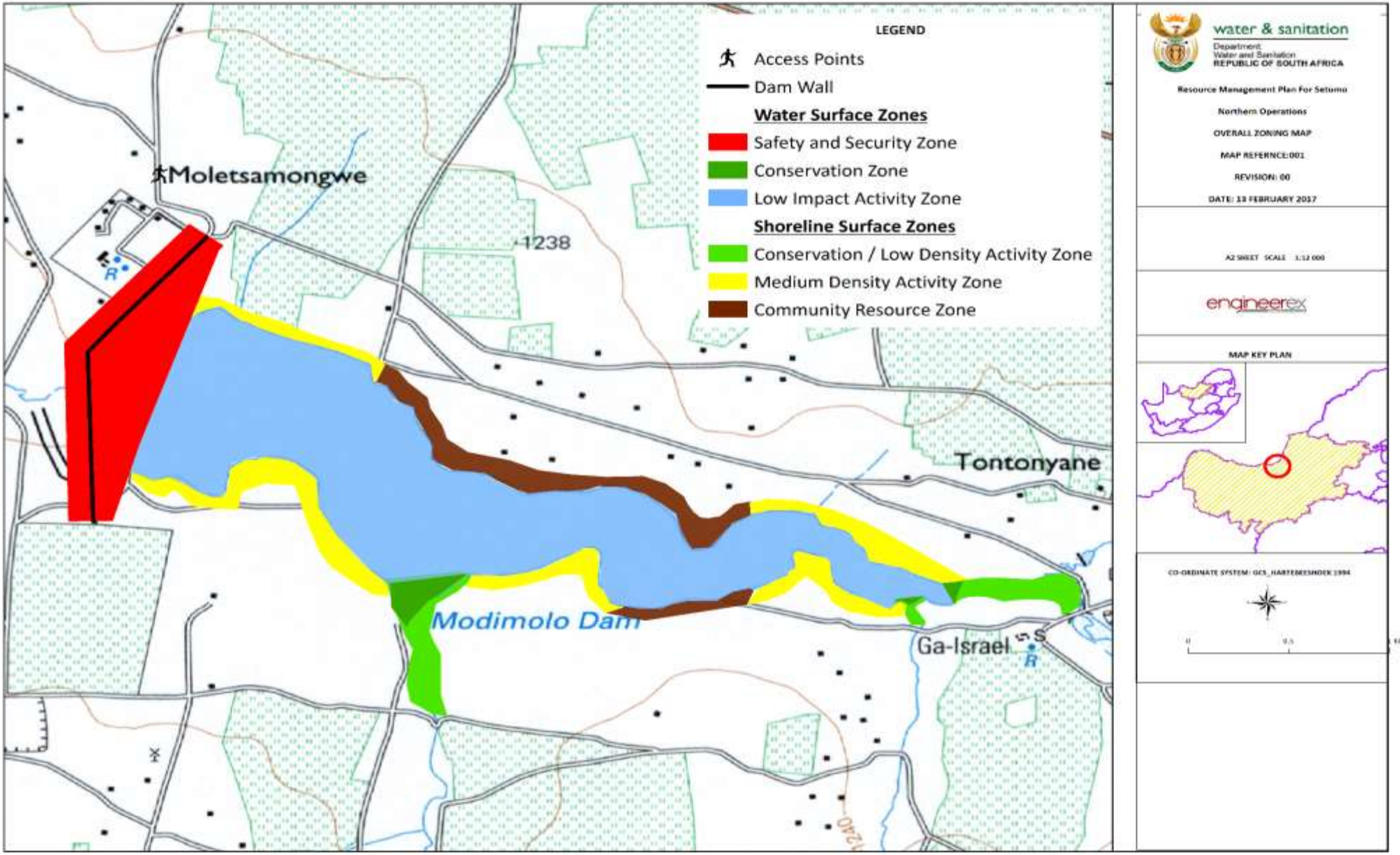

Figure 22: Proposed Overall Zoning Map

4.2.3 Carrying Capacity

The carrying capacity of a water resource represents the maximum level of users and related infrastructure that the water resource and surrounding area can accommodate, without diminishing user satisfaction, the economy and culture of the area.

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

Determining the carrying capacity ensures that recreational use of the dam is safe and that users do not feel crowded and enjoy their use of the dam. There are three kinds of carrying capacity, namely:

- **Physical Carrying Capacity** (PCC) – this is the maximum number of users that can physically fit onto the water surface at any given time;
- **Real Carrying Capacity** (RCC) – this is the maximum number of users that can use the resource once corrective factors that are unique to the dam are taken into account; and
- **Effective** (or permissible) **Carrying Capacity** (ECC) – this is the number of visitors that can use the resource, given the management capacity.

Each level constitutes a corrected capacity level of the preceding level. The PCC is always greater than the RCC, and the RCC is greater than the ECC, thus: **PCC > RCC and RCC ≥ ECC.**

The process of establishing the carrying capacity is normally determined through the following tasks:

- Analysis of recreation and water resource management policies;
- Analysis of objectives of the water resource;
- Analysis of current recreational water use;
- Definition, strengthening or modification of policies regarding recreational water use management;
- Identification of factors influencing recreational water use; and
- Determination of the recreational water use carrying capacity.

The carrying Capacity for Setumo Dam was calculated using the Low Supply Level (LSL).

Physical Carrying Capacity (PCC)

PCC refers to the maximum number of users that can physically fit into or onto a defined water resource, over a particular time.

Formula: PCC = A x U/a x Rf

Where:

A = available Surface area for public use
U/a = area required per user
Rf = rotation factor (number of visits/day)

A = **178.9** (40% of the water level).

The ***U/a*** is assumed to be the average which was calculated as 1 craft/3 ha. And again the rotation factor (*Rf*) is assumed as 1 visit per day.

Craft	U/A (ha/craft)
Rowing	0.4
Canoe	0.3
Paddleboat	0.3
Kayaks	0.3
Float tubes	0.3
Rowing shells	0.4
Average	0.8

Based on the table above the average hectare per user is 0.3 ha (3 000 m^2), the value of 2.0 ha (20 000 m^2) can be acceptable area per user. This has been chosen in order to ensure that the dam is not overcrowded, as such impacting on the sense of the area.

Therefore: **PCC = A x U/a x Rf**

= 178.9 ha x (1 craft/2ha) x 1

= 89 crafts

Real Carrying Capacity (RCC)

It refers to the maximum permissible number of users to the water resource, once the corrective factors (Cf) derived from the particular characteristics of the site have been applied to the PCC.

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

Where:

Cf = a corrective factor expressed as a percentage.

The RCC takes into account factors that limit recreation use (craft based) of the dam. For Setumo Dam these factors includes sensitive areas, such as conservation areas (178.01 ha) as well as aspects regarding the safe operation and management of the dam (8.75 ha).

These factors accounts for 195.75 ha, which is 44%

Therefore: RCC = **PCC x (100 – cf1) % x (100 – cf1) % x (100 – cf1) %**

= 89.45x (100 – 44) %/100

= 50 crafts

Effective Carrying Capacity (ECC)

The maximum number of visitors that a site can sustain, given the management capacity (MC) available.

ECC = [Infrastructure Capacity x Management Capacity] x 100/ RCC

Given that there is no recreational facilities e.g slipways at Setumo Dam, the infrastructure capacity is estimated to be approximately 0. The management capacity is also estimated to be low as there is no formalised recreational management structure in place and thus the ECC is currently 0. Once a proposed Institutional Structure and infrastructure capacity is in place, the ECC can be recalculated to verify if the RCC can be possible.

4.3 STRATEGIC PLAN

The Strategic Plan is informed by the objectives identified by stakeholders and through research on potential opportunities at the dam. The objectives are broken down into management fields which are listed below in a format offering ease of reference:

- Objective (What do we want?);
- Motivation (Why do we want to achieve this?);
- Action Projects (How do we achieve this?); and
- Management Support (Who will be involved?).

In **Tables 16 – 18**, the Strategic Plan on how to achieve the identified objectives identified regarding the dam is outlined.

Table 16: Strategic Plan for KPA 1: Resource Management

KPA 1: Resource Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Purchased Boundary Survey • To determine the purchased boundary as well as associated lines (buffer line, 1:100 floodline and high floodline) which assists with proper planning around the dam.	• The dam was built by former Bophuthatswana Government as such there is no much information with regards to the extent of the GWWs. Furthermore, DWS (Land Matters Section) indicated that the dam is not yet properly surveyed.	• The dam needs to be surveyed to determine the purchase boundary line as well as associated lines (buffer line, 1:100 floodline and high floodline).	• DWS is responsible for generating purchase boundary.
Illegal/Unlawful Structures Within The Dam Basin • To ensure that all activities undertaken within the dam are permitted by DWS and conducted in accordance with the relevant legislation and policies such as NWA and NEMA Regulations.	• There are identified remains of what looks like poles or fence within the water surface. It is not clear how these structures led into the water surface.	• Survey the area to ascertain the extent of the Government Waterworks (GWWs). • Survey of all the existing activities to ensure compliance with the relevant legislature and policies. • All transgressions should be reported to the relevant Governmental Departments (such as SAPS and READ).	• Relevant Government Departments such as Department of Environmental Affairs (DEA), DWS, North West Department of Rural, Environment and Agricultural Development (READ), that are responsible for issuing relevant permit in regards to use and development of the water resource South African Police Services (SAPS) should also be involved as they deal with curbing illegal activities within the state of South Africa.
Alien Fauna And Flora Management	• Alien invasive species have a detrimental effect on the natural ecology of the dam and its surrounding. These species result in a decrease in indigenous biodiversity	• All recreational activities must be monitored and evaluated to ascertain if there is any pollution threat to the dam. • Frequent monitoring of water quality.	• North West Department of Rural, Environment and Agricultural Development (READ); • National Department of Environmental Affairs (DEA)'s Working for Water; and

KPA 1: Resource Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
• To remove the alien invasive species within and around the dam	and usually result in the overall degradation of the ecological integrity of the dam basin. • The dam and its surrounding is a home to alien fish species (such as trout) and also the alien invasive species such as Argemone Mexican and Nicotiana glauca. (These terrestrial Alien Plant Species are categorized in Category 1b). The further spreading can pose a detrimental impact on the ecology of the dam and effects the natural aesthetic of the area in general.		• Department of Agriculture, Forestry and Fisheries (Land Use and Soil Management Section).
<u>Water Quality</u> • To improve and maintain acceptable water quality in the dam.	• The water quality is a key issue that needs to be addressed to ensure the sustainable use of the dam by all users. The dam is situated near semi-urban area and is exposed to various sources of pollution within the catchment. The dam is classified as hypertrophic. Poor water quality affects the biodiversity and the	• Integrated Water Quality Management must be implemented. • Effective management of land use activities (water users) within the catchment that have potential or impacting the quality of water in the dam. • Catchment Management Strategy (CMS) must be amended/ developed to address declining water quality in the dam	• All Governmental Departments that have mandate and/ or management roles in relation to water quality and environmental health, need to be involved. This will include DWS, READ, DEA and NMMDM. • DWS should step in and assist the municipality upon evidence of their failure to abide by the minimum standards or requirements that have been defined by the green drop certification programme for

KPA 1: Resource Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
	recreational use of the dam.	• Discussions between DWS, NMMDM regarding the management of sewage around the dam should be undertaken. • Dam Management Committee (DMC) must develop a programme for monitoring and reporting of the water quality issues.	wastewater treatment quality management regulation.
Zoning Plan • To compile a Zoning Plan for the dam	• According to the RMP guideline, a Zoning Plan must be compiled in terms of DWAF's Guidelines for Compilation of Zoning Plans for Government Waterworks (DWAF, 1999).	• The Zoning Plan should accommodate all feasible recreational activities within the purchased line.	• DWS, PSP and other relevant Departments should be involved so that they can give their input in terms of their respective mandates.

Table 17: Strategic Plan for KPA 2: Resource Utilisation

KPA 2: Resource Utilisation			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Dam Safety • To ensure safety regarding the recreational use of the dam. • To meet the user needs and satisfy government requirements regarding the standard of activities and facilities, appropriateness of land use, compliance with applicable legislation	• The dam is a major attraction to various water based sports and outdoor enthusiasts within the Province. Currently there is no overarching safety system at the dam and no mechanism for reporting of environmental and recreational emergencies and incidents.	• Implementation of DWS Incident Management System. • Develop information material (i.e. signage and pamphlets etc.) to convey safety rules at the dam. • Appoint safety officers to ensure that the safety rules are adhered to at all times. • Develop specific rules for activities or uses for which this may be required.	• Relevant Government Departments such as DEA, SAPS, DWS and SAMSA that are responsible for safety on the GWWs, resource management or dealing with safety in general within the state of South Africa must be consulted.

KPA 2: Resource Utilisation			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
and rights of use as well as access to the dam.		• An agreement needs to be entered into by DWS and the entity which will manage and operate public facilities. • Public access should be provided and the entry fees need to be reasonable to ensure that the dam remains accessible and affordable to the local community. • The entry fees need to be reasonable to ensure that the dam remains accessible and affordable to the local community.	
Public And Commercial Access, Use And Development • To provide adequate public access for broader public use of the water resource and its associated State Land through controlled authorized access and associated infrastructure development.	• There is no fence around the dam and no authorised public access and as such, the provision of public access is of outmost importance to the surrounding Local Communities.	• An agreement needs to be entered into by DWS and the entity which will manage and operate public facilities. • Public access should be provided and the entry fees need to be reasonable to ensure that the dam remains accessible and affordable to the local community. • The entry fees need to be reasonable to ensure that the dam remains accessible and affordable to the local community.	• DWS, READ, NMMDM, MLM and NDT should be engaged in this regards.
Dams Carrying Capacity • To ensure that the organised events are well planned and managed in order to meet the participant's expectations as well as to ensure compliance with Biodiversity Conservation Legislations.	• Carrying capacity is an effective management tool to control access, utilization and development within the dam basin. Overuse of the dam may not only impact on the water resource and the surrounding environment, but will also affect the safety and users experience. This can also results in social impacts	• Establish density controls for activities and facilities that requires carrying capacity assessments (i.e. number of boats per hectare). • Implement density controls as per approved accepted utilization level. • Types of recreational activities which will not be permitted within the dam basin should also be clearly stipulated.	• Environmental and other planning institutions including relevant Government Departments need to be consulted when establishing acceptable densities.

KPA 2: Resource Utilisation			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
	such as, crimes, accidents, conflicts, etc.		
<u>Illegal Fish Harvesting</u> • To promote sustainable harvesting of fish	• Subsistence fishing by the Local Community remains an active use of the dam, however, this must be regulated by relevant policy to avoid overfishing within the dam. These can also be used to manage alien invasive fish species such as carp and bass fish abundant within the dam.	• Management authority or DWS must develop a communication signage in order to effectively inform different angling groups about the dam fishing rules. • Appoint safety officers that will monitor compliance of the dam fishing rules.	• DWS, READ, DAFF and other relevant conservation NGOs within the Mahikeng Area must be involved.
<u>Aquaculture</u> • To promote sustainable harvesting of fish	• Aquaculture is important in ensuring a consistent supply of aquatic species for human consumption. • A large number of community still rely on subsistence fishing	• Conduct a feasibility study to determine the viability of introducing aquaculture at the dam. • Provide training to workers. • Appoint safety officers that will monitor compliance of the dam fishing rules.	• DWS and READ
<u>Illegal Sand Mining</u> • To promote sustainable sand mining around the dam for the local community to benefit from the sand mined at the dam.	• There is illegal sand mining taking place at the dam by local community. The area is relatively poor and sand mining serves as source of income either by selling bags of sands or building their houses.	• Local communities need to be educated on procedures to follow in order to mine legally e.g. Applications of mining Authorisations/permits.	• DMR, DEA and DWS

Table 17: Strategic Plan for KPA 3: Benefit Flow Management

KPA 3: Benefit Flow Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
Local Economic Development • To ensure that local communities participate and benefit in local development initiatives happening in and around the dam. This can be through development of eco-tourism, recreational opportunities as well as subsistence fishing. • To establish capacity building and training within the local communities.	• The provincial and local governments identify tourism sector as a vehicle for development within the province. The accessibility of the dam and its historical significance makes the dam ideal destination for various recreational use. Potential exists for various sports and leisure activities including swimming, fishing picnicking and camping. It is imperative that the local communities benefit from tourism projects implemented at the dam.	• Implement Skills Development Programmes where opportunities exist. • Provision of suitable day visit areas within the dam as majority of communities enjoy visiting the dam during weekends. This will reduce littering at dam as there will be good waste management containers onsite. • To subsidise the recreational events in order to accommodate all classes.	• DEA, DAFF, NMMDM, MLM and DMC. • Formalize an agreement with local community fishers regarding access and use of the dam for subsistence fishing. • Develop a strategy on capacity building and training programmes such as training locals who will be employed and they do not have necessary skills to e.g. drive boats and work in fish hatcheries etc.
Institutional Arrangement And Management • To ensure that a suitable and efficient institutional structure with appropriate powers and delegations is in place to effectively manage the recreational utilization of dam and its associated State Land in accordance with the RMP to be developed for the dam.	• Officially, the dam is managed by DWS, who functions as the custodian of all surface water in the Republic of South Africa. Currently, there is no institutional structure in place to manage recreational use of the dam.	• Formalization of an institutional structure, which is representative of all relevant Stakeholders. • The roles and responsibilities of the role players must be clearly defined and understood. • The improvement of incident management through the implementation of the CIWSP best practice model. • Improved institutional arrangements and management, through the implementation of standardised and harmonised AtoN and demarcation markers	• DWS Institutional Establishment section, PSP and other relevant Departments should be involved so that they can give their input in terms of their respective mandates. • DWAF's considerations on the Institutional Arrangements for Managing Use of Water for Recreational Purposes guideline (2003).

KPA 3: Benefit Flow Management			
Objective (What do we want)	**Motivation (Why do we want to achieve this)**	**Action Projects (How do we achieve this)**	**Management Support (Who will be involved)**
		in order to improve safety of navigation by implement AtoN and demarcation markers as required.	

4.4 FINANCIAL PLAN

The RMP provides guidance on cost recovery mechanisms to ensure the sustained and improved management of the dam. There are opportunities for PPPs which could further unlock the economic potential of the dam. PPPs allows for DWS to make State Assets such as GWWs available to private parties who wish to engage in tourism related commercial operations (DWAF, 2009). PPPs should be established as per Regulation 16 of the National Treasury.

The dam is a state asset and as such all profits generated from the recreational use, should also be used to further develop the dam. People should not be denied access to the dam. All fees associated with the usage of the dam for recreation should take into account the socio-economic status of the users. The access fees should make a provision for equitable access.

The information acquired from the RMP will be used to produce the Business Plan based on the action projects for each objective as stipulated under the Strategic Plan. However, many of the identified objectives are not of commercial nature and as such these non-economic objectives will not feature in the BP.

The BP provides a good description of possible economic recreational activities and the methods that can be used or enhanced to achieve the ultimate vision and the key objectives of Setumo Dam RMP. It also describes the financial management and operational requirements to implement the Objectives of the RMP

The BP will include a Financial Plan (FP) which will facilitate the implementation of the RMP by providing implementation program cost estimate for all possible economic recreational activities.

WAY FORWARD

Once the RMP and its BP are approved by the Minister of Water and Sanitation, it will be published in the Government Gazette as a regulation in terms of Section 26 of the NWA.

Review of RMP

According to DWAF (2006), the RMP is reviewed and updated every five (5) years to ensure that the management objectives remains relevant and management actions are continually improved. The BP is updated annually. **Figure 23** illustrates the RMP & BP review framework.

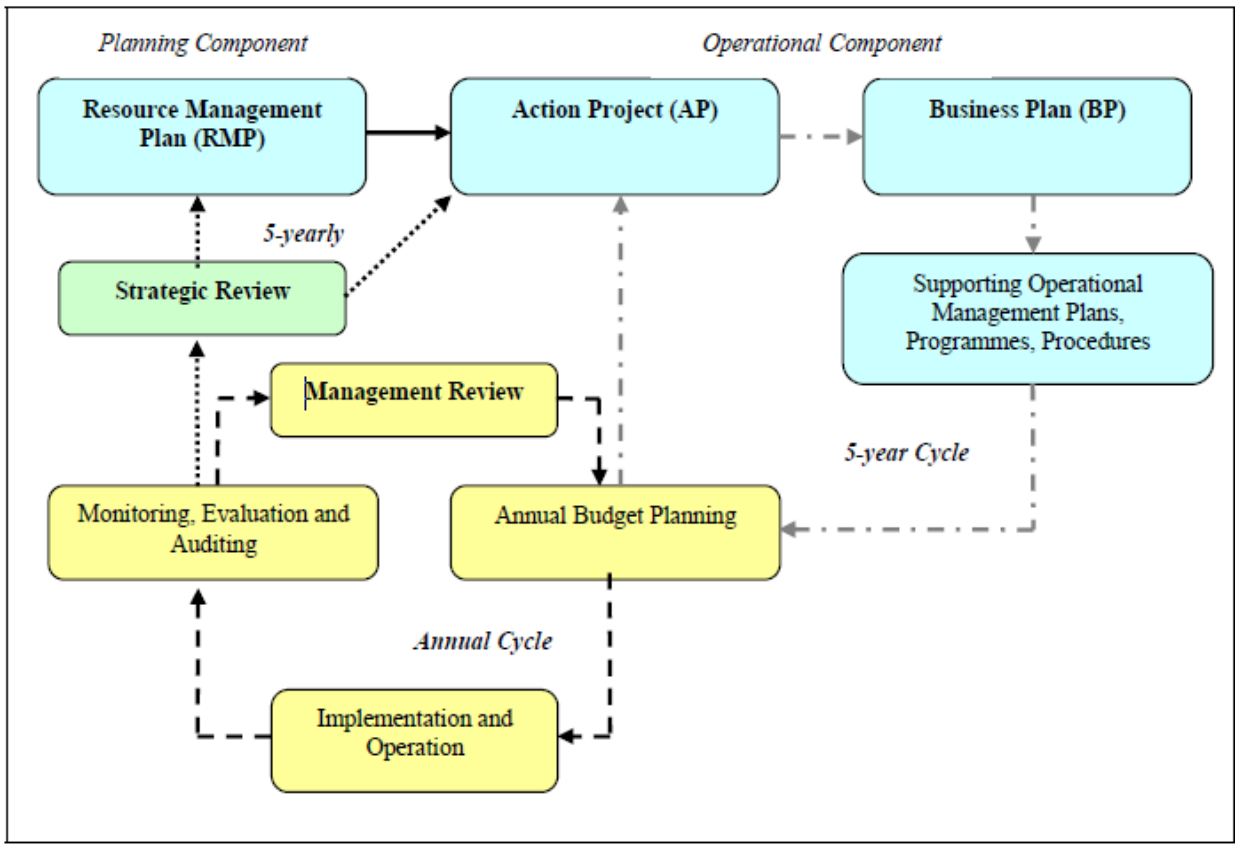

Figure 23: RMP and BP Review Framework

CONCLUSIONS

The RMP documents the challenges that exists within the Setumo Dam that can significantly impact on the utilisation and management of the dam and it's surrounding for recreational purposes. Such factors include legal, biophysical, socio-economic, hydrological as well as access to the resource. These factors will assist DWS with the most appropriate approach to ascertain that the issues are addressed before the implementation of the RMP.

The RMP will assist in effectively managing the dam and its surrounding environment. Furthermore its function is to implement an **Institutional Plan** for the effective management of dam. The focus on Institutional Plan is accompanied by a **Zonal Plan** which provides guidance on potential activities that are allowed on the dam, together with a **Strategic Plan**.

In addition, a **Financial Plan** will provide guidance on funding requirements and funding options to implement the objectives of the RMP.

Furthermore the RMP promotes community participation and beneficiation, through Stakeholders engagement which were conducted to obtain common key objectives to be met by the RMP. The vision for the dam was formulated from the key common objectives identified by Stakeholders. Based on the strategic objectives identified for Setumo Dam, a BP has been developed to describe a manner in which the potential recreational activities are to be financially resourced. Furthermore, by including the RMP in the Local Initiatives such as IDPs, LED, etc, can ensure effective co-operative governance as well as to provide necessary support with regards to the use of the dam for recreational purposes. Undertaken in this manner, it is believed that the potential of the water resource can be optimally unlocked in a sustainable and equitable manner.

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APPENDICES